		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
Project #		Project Name		Locality	nels classified a Cowardin	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact	
-				,	Class.			SAR#	length	Factor	
N/A Nam	e(s) of Evaluat	2RVA - Area		VA e and Informa	R2	02070010	11/24/2015				
	ckwell, R. Ma	. ,				01-S	ΓR-01				
. Channel C	Condition: Asse	ess the cross-sec	tion of the stream	n and prevailing co	ondition (erosion,						
	Opti	mal	Subo	ptimal c	Conditional Catego	ry ginal	Po	or	Sev	vere	
		WA AND	1			less than Severe or	Overwidend		1	5	
Channel Condition	Very little incision o 100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba- sediment depositio	n or natural rock, 00%). AND/OR bankfull benches as to their original developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60-Depositional feat stability. The bar channels are wellikely has access to or newly develope portions of the r	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream to bankfull benches, of floodplains along reach. Transient	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran instability. Depositi stability, may be	stable than Severe wer bank slopes. essent on 40-60% of tative protection on Streambanks may errout. AND/OR 40- n is covered by diment may be sisent, contribute on that contribute to t forming/present.	widen further. Major are near vertical. E 60-80% of bank protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	ority of both banks rosion present on its. Vegetative int on 20-40% of fficient to prevent the 60-80% of the diple sediment. orary/transient in uting to instability. dichannels have	banks, is not pre Obvious bank slo Erosion/raw ban AND/OR Aggrading	stability. Severe tained within the ad below average najority of banks tut. Vegetative on less than 20% of eventing erosion. oughing present. lks on 80-100%. g channel. Greater	
	10% of I			rs 10-40% of the bottom.	vegetative protecti banks and deposit	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the band sediment depose	ks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	outing to instability. channels and/or	CI
Score	3	3		.4		2	1. R-01 (01-ST		1	l	2.4
RIPARIAI	N BUFFERS: A	Assess both bank	d's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt	h may be accep	table)		
. RIPARIAI	N BUFFERS: A		Con	an areas along the ditional Cateo ptimal	gory	ginal	ts of length & widt		table)		
RIPARIAI Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	imal  3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.				
Riparian	Opti	imal 3 inches) present, anopy cover and a derstory. Weltands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/40.700/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present</a></a></a></a></a>	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine so	Tree stratum (dbh > with > 60% tree canon-maintained und located within the	imal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate rips Secriptors. Determine Scolow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	imal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate rips Secriptors. Determine Scolow. Enter the % I	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	imal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban ach by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>>		
Riparian Buffers  Condition Scores  Delineate ripesscriptors. Determine scelow. Enter the % I	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban ach by measuring score for each r 100%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5		cores*0.01)/2	CI
Riparian Buffers  Condition Scores  Delineate rips Secriptors. Determine Scolow. Enter the % I	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	imal  3 inches) present, anopy cover and a deferstory. Wetlands for liparian areas.  5  each stream ban ach by measurin Score for each r 100% 1.2	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lols, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%	NOTES>>  Cl= (Sum % RA * S		CI 1.20
Riparian Buffers  Condition Scores  Delineate ripsecriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	5  sach stream ban ach by measurin 100% 1.2  100% 1.2  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies the seeded and stabilized area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lols, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	1.20	
Riparian Buffers  Condition Scores  Delineate rippescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAI	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	5  sach stream ban ach by measurin 100% 1.2  100% 1.2  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the condition of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies the seeded and stabilized area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lols, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.20	
Riparian Buffers  Condition Scores  Delineate ripescriptors  Determine scelow Enter the % I	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	55  sach stream ban sach by measurin 100% 1.2  100% 1.2  aried substrate siffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  parian category in  zes, water velocit exes, stable featur  Subo	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you  pris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 0.5  Low 100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.20	
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % I Right Bank  Left Bank B. INSTREAI ndercut banks; Instream	Tree stratum (dbh > with > 60% tree oc onon-maintained und located within the located wit	5  sach stream ban each by measurin 100% 1.2 100% 1.2 re typically present	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in the containing both and the containing both and containing both experience of the containing both experience of	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrud layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High 0.85  Calculators are provided at Category Mar Stable habitat ele present in 10-30 are adequate for are dequate for a sea dequate for a se	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >  NOTES>>	1.20	

	St	ream In	npact A	ssessm	ent For	m Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	DC2RVA - Area	01	VA	R2	02070010	11/24/2015	01-STR-01			
4. CHANNEL	L ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of cl	nannel, channeliz	ation,	NOTES>>		
embankments, s	poil piles, constrictions, livestock		Conditiona	I Category				Some rip-r		
	Negligible	Mir	nor		erate	Sev	ere	banks adja		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with gal cem	of the channel in the parameter PR 80% of banks bion, riprap, or	railroad ba	illast.	CI
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5			1.30
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			
NOTE: The CIs and R	RCI should be rounded to 2 decimal places. T	he CR should be roun	nded to a whole number	er.				CONDITION IN		
								CI= (Sum of all C		
								ION REQUIRE!	/IENI(CR)>>	0
INSERT PHO	TOC.						UN = KU	/ Λ LI⁻ Λ IΓ		•
DESCRIBE F	PROPOSED IMPACT:									

Project/Site: DC2RVA - Area 01

NC DWQ Stream Identification Form Version 4.11

Date: 11/24/2015

01-STR-01

Latitude: 38.860808

Evaluator: M. Rockwell, R. Mangum	County: Arlingto	on	Longitude: -77	.047386
<b>Total Points:</b> 41.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle on rmitten Perenni		
A. Geomorphology (Subtotal = 17.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	2	<u>3</u>
<ol> <li>In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence</li> </ol>	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	$\bigcirc$	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes =	$\rightarrow$
a artificial ditches are not rated; see discussions in manual	l .			
B. Hydrology (Subtotal = 10.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	$\overline{}$	0.5	0
15. Sediment on plants or debris	0	0.5		1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	-	0 = 0	Yes =	
C. Biology (Subtotal = 13.5	L			
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	$\overline{}$	1	2	(3)
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5	1	(1.5)
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other metho	ds. See p. 35 of manua			
Notes: Field Sheet 01-STR-01 (01-A-STR-01).	·			
Sketch:	organic debris	s line (leaf litt	ter)	
A (	1			_
//	/			
7				

	Str	eam A	SSESS ified Stream N			•	1 1)			
		For use	in wadeable chan	nels classified as	intermittent or p	erennial		Impact/SAR	Impost	
Project #	Project Nam	е	Locality	Class.	HUC	Date	SAR#	length	Impact Factor	
N/A	DC2RVA - Area	02	VA	R1	02070010	11/25/2015				
Nam	e(s) of Evaluator(s)	Stream Name	and Informat							
M. Ro	ckwell, R. Mangum	02-STR-01 (Four Mile Ru								
. Channel C	ondition: Assess the cross-section	on of the stream and	d prevailing condition	on (erosion, aggrad	dation)					
	Optimal	Subo	ptimal	Conditional Categor	y ginal	Po	or	Sev	oro	
Channel Condition	Very little incision or active erosion; 8 (100% stable banks. Vegetative surfac protection or natural rock, prominent (80-100%). ANID/OR Stable point bans/bankfull benches are present.	Slightly incised, ferosion or unprotein of banks are seveletative protein prominent (60 Depositional feat stability. The bar	ew areas of active cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to Mkfull and low flow	Often incised, but I Poor. Banks more s Poor due to low Erosion may be proth banks. Vegeta 60% of banks. S bevertical or unde 60% of steam is co	less than Severe or table than Severe or ver bank slopes. essent on 40-60% of tive protection on 40 treambanks may rorut. AND/OR 40- overed by sediment. remporary/transient,	Overwiden Vertically/laterally widen further. Maj are near vertical. E	ed/incised. Instable. Likely to ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent 80-80% of the	Deeply incised vertical/lateral in- incision, flow con banks. Streambe rooting depth, m vertical/undercut. V.	(or excavated), stability. Severe tained within the d below average ajority of banks	
	Access to their original floodplain or fully developed wide bankfull benches Mid-channel bars, and transverse ban few. Transient sediment deposition covers less than 10% of bottom.	has access to ba newly developed portions of the sediment covers 10	lefined. Stream likely inkfull benches, or I floodplains along reach. Transient 0-40% of the stream tom.	contribute instabil contribute to s forming/present. / channels have vege > 40% of the bank	ity. Deposition that tability, may be AND/OR V-shaped etative protection on sa and depositional ntribute to stability.	Sediment is temp nature, and contrib AND/OR V-shape vegetative protecti 40% of the banks a deposition	orary/transient in outing to instability. ed channels have on is present on > nd stable sediment	present on less tha not preventing eros sloughing present. on 80-100%. ANI channel. Greater the bed is covered contributing to instat channels and/or s	n 20% of banks, is ion. Obvious bank Erosion/raw banks D/OR Aggrading nan 80% of stream by deposition, illity. Multiple thread	C
Score	3	2	.4	:	2	1.	6	1		1.
RIPAPIAN	BUFFERS: Access both bortile	100 foot riperion	eas along the enti-		•		01-STR-03	4 mile Run.		
. RIPARIAN	BUFFERS: Assess both bank's  Optimal	Con	eas along the entire aditional Catego ptimal	e SAR. (rough me	•		acceptable)	NOTES>> There are tr	ees	
RIPARIAN Riparian Buffers		Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60%	ditional Categ	e SAR. (rough me	asurements of len	gth & width may be	acceptable)  or  Low Poor:	NOTES>> There are tr present in t sections, buthe banks a bordered by surfaces su	ees iny ut most of re / paved ch as roads, and	
Riparian Buffers	Optimal  Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and a non-maintained understory. Wetland:	High Suboptimal: Riparian areas with tree stratum (dth > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	e SAR. (rough me  gory  Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30%	asurements of len  ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	acceptable)  Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> There are tr present in t sections, buthe banks a bordered by surfaces su sidewalks,	ees iny ut most of re / paved ch as roads, and	
Riparian	Optimal  Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and a non-maintained understory. Wetland:	High Suboptimal: Riparian areas with tree stratum (db. 73 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (db. 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	asurements of len  ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Pro High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	acceptable)  Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or otlots, trails, or otlots, trails, or otlots, conditions.	NOTES>> There are tr present in t sections, buthe banks a bordered by surfaces su sidewalks,	ees iny ut most of re / paved ch as roads, and	
Riparian Buffers  Condition Scores  Delineate ripa	Optimal  Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and a non-maintained understory. Wetlandt located within the riparian areas.	High Suboptimal: Riparian areas with tree stratum (dth > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  The Condition Categor estimating length	Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  ories and Condition and width. Calculation	e SAR. (rough me  Bory  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrun, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Pro High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	acceptable)  Low Poor: Impervious surfaces, mine spoil fands, denuded surfaces, row crops, active feed folios, trails, or other comparable conditions.  Low 0.5	NOTES>> There are tr present in t sections, buthe banks a bordered by surfaces su sidewalks,	ees iny ut most of re / paved ch as roads, and	
Riparian Buffers  Condition Scores  Delineate ripa	Optimal  Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and a non-maintained understory. Wetland located within the riparian areas.  1.5  Tian areas along each stream bank is user footage for each by measuring iparian Area and Score for each ripa % Riparian Area 100%	High Suboptimal: Riparian areas with tree stratum (dth > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  The Condition Categor estimating length	Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  ories and Condition and width. Calculation	e SAR. (rough me  Bory  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrun, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	gth & width may be  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated anon-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt of % R	acceptable)  Low Poor: Impervious surfaces, mine spoil fands, denuded surfaces, row crops, active feed folios, trails, or other comparable conditions.  Low 0.5	NOTES>> There are tr present in t sections, buthe banks a bordered by surfaces su sidewalks,	ees iny ut most of re / paved ch as roads, and	
Riparian Buffers  Condition Scores  Delineate ripa Determine squ Enter the % R	Optimal  Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and a non-maintained understory. Wetland located within the riparian areas.  1.5  1.5  trian areas along each stream bank i ware footage for each by measuring ipparian Area and Score for each riparian areas covered to the stream bank in the	High Suboptimal: Riparian areas with tree stratum (dth > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  The Condition Categor estimating length	Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  ories and Condition and width. Calculation	e SAR. (rough me  Bory  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrun, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	gth & width may be  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated anon-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt of % R	Low Poor: Impervious surfaces, mine spoil flands, denuded surfaces, row crops, active feed lots, trails, or official surfaces, row crops, active feed conditions.  Low 0.5	NOTES>> There are tr present in t sections, be the banks a bordered by surfaces su sidewalks, parking lots	ees iny ut most of re / paved ch as roads, and	
Riparian Buffers  Condition Scores  Delineate ripa Determine squ Enter the % R	Optimal  Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and a non-maintained understory. Wetlandt located within the riparian areas.  1.5  Trian areas along each stream bank is user footage for each by measuring iparian Area and Score for each ripa % Riparian Area 100% Score > 0.5	High Suboptimal: Riparian areas with tree stratum (dth > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  The Condition Categor estimating length	Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  ories and Condition and width. Calculation	e SAR. (rough me  Bory  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrun, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	gth & width may be  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated anon-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt of % R	Low Poor: Impervious spoil lands, denuded surfaces, now crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> There are tr present in t sections, be the banks a bordered by surfaces su sidewalks, l parking lots	ees iny ut most of re / paved ich as roads, and is.	
Riparian Buffers  Condition Scores  Delineate ripa Determine squ Enter the % R	Optimal  Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and a non-maintained understory. Wetland located within the riparian areas.  1.5  Tian areas along each stream bank is user footage for each by measuring iparian Area and Score for each ripa % Riparian Area 100%	High Suboptimal: Riparian areas with tree stratum (dth > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  The Condition Categor estimating length	Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  ories and Condition and width. Calculation	e SAR. (rough me  Bory  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrun, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	gth & width may be  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated anon-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt of % R	Low Poor: Impervious surfaces, mine spoil flands, denuded surfaces, row crops, active feed lots, trails, or official surfaces, row crops, active feed conditions.  Low 0.5	NOTES>> There are tr present in t sections, be the banks a bordered by surfaces su sidewalks, parking lots	ees iny ut most of re / paved ch as roads, and	
Riparian Buffers  Condition Scores  Delineate ripa Determine squ Enter the % R Right Bank  Left Bank	Optimal  Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and a non-maintained understory. Wetland located within the riparian areas.  1.5  Trian areas along each stream bank is user footage for each by measuring iparian Area and Score for each ripa (Riparian Area 100% Score > 0.5	High Suboptimal: Riparian areas with tree stratum (dth > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  to Condition Categ or estimating length rian category in the	Low Suboptimal: Riparian areas with tree stratum (dth > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  ories and Condition and width. Calculablocks below.	e SAR. (rough me  gory  Mary  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Scores using the ators are provided	asurements of len  ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  descriptors. for you below.	gth & width may be  Po  High Poor: Lawns, mowed, and maintained areas, nurseries: no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mis spoil lands, denuded surfaces, row crops, active feed lots, trails, or districtions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> There are tr present in t sections, bu the banks a bordered by surfaces su sidewalks, u parking lots  CI= (Sum % RA*So Rt Bank CI >	ees inny ut most of re / paved och as roads, and s.	
Riparian Buffers  Condition Scores  Delineate ripa Determine squ Enter the % R Right Bank  Left Bank  Instream	Optimal  Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and a non-maintained understory. Wetland located within the riparian areas.  1.5  Tana areas along each stream bank is user footage for each by measuring iparian Area and Score for each ripa % Riparian Area > 100% Score > 0.5  Riparian Area> 100% Score > 0.5	High Suboptimal: Riparian areas with tree stratum (dth > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  The Condition Categor estimating length rican category in the six water velocity and features.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  ories and Condition and width. Calculate blocks below.	e SAR. (rough me  gory  Mary  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Scores using the ators are provided	asurements of len  ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  descriptors. for you below.	gth & width may be  Po  High Poor: Lawns, mowed, and maintained areas, nurseries: no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil flands, denuded surfaces, row crops, active feed flost, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5	NOTES>> There are tr present in t sections, but the banks a bordered by surfaces su sidewalks, l parking lots  Cl= (Sum % RA * Sc Rt Bank Cl > Lt Bank Cl > NOTES>>	ees iny ut most of re / paved ich as roads, and is.	
Riparian Buffers  Condition Scores  Delineate ripa Determine squ Enter the % R Right Bank  Left Bank  INSTREAN anks; root mats	Optimal  Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and a non-maintained understory. Wetland located within the riparian areas.  1.5  1.5  Tian areas along each stream bank is pare footage for each by measuring iparian Area and Score for each ripa (Score > 0.5)  % Riparian Area 100%  Score > 0.5  1 HABITAT: Varied substrate size. SAV; riffle poole complexes, stables	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  The Condition Categ or estimating length rian category in the s, water velocity an features.  Subo  Stable habitat ele present in 30-50% adequate for i	Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  ories and Condition and width. Calculablocks below.	e SAR. (rough me  gory  Mary  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dol) > 3 inches) present, with <30% tree canopy cover.  High  0.85  Scores using the ators are provided  ators are provided  I Category  Mary  Stable habitat ele- present in 10-30% adequate for r	asurements of len  ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shruh and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  descriptors. for you below.	gth & width may be  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated anon-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr  of % R Blocks e	acceptable)  Or  Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or disconditions.  Low  0.5  Desums iparian qual 100  100%  100%	NOTES>> There are tr present in t sections, be the banks a bordered by surfaces su sidewalks, l parking lots  CI= (Sum % RA * Sc Rt Bank CI > Lt Bank CI > Stream doe	ees iny ut most of re / paved ich as roads, and is.	C 0.5

	S	tream lı	mpact A	ssessm	ent Fori	m Page	2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	DC2RVA - Area	02	VA	R2	02070010	11/25/2015	02-STR-01			
4. CHANNEL	ALTERATION: Stream crossing s, livestock	s, riprap, concrete	, gabions, or concr	ete blocks, straight	tening of channel, o	channelization, em	bankments, spoil	NOTES>>	Highly	
piles, constrictions	s, livestock		Conditiona	I Category				O a		
	Negligible	Mi	nor		erate	Sev	ere	through urb	oanized	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% o by any of the chann in the parameter g 80% of banks sho riprap, or	el alterations listed uidelines AND/OR ored with gabion,	area.		CI
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5			0.50
	REACH	CONDITION	INDEX and S	TREAM CON	INDITION UNIT	TS FOR THIS	REACH		•	
NOTE: The Cls and RO	CI should be rounded to 2 decimal places. The	CR should be rounded	to a whole number.					I CONDITION IN		
					1			I= (Sum of all C		
								TION REQUIRE	MENT (CR) >>	0
INSERT PHO	TOS:						CIX = IXC			
DESCRIBE P	ROPOSED IMPACT:									
DESCRIBE PI	NOTUSED INITACI:									

NC DWQ Stream Identification Form Version 4.11 Four Mile Run 02-STR-01

Date: 11/25/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.840928
Evaluator: M. Rockwell, R. Mangum	County: Arlington	Longitude: -77.047358
<b>Total Points:</b> 41 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 13)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	(0)	1	2	3
ripple-pool sequence				
Particle size of stream substrate		1	(2)	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	<b>3</b>	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	No	0 = 0	Yes =	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 10				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	Y	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes =	= 3
C. Biology (Subtotal = 18)	_			
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	$\forall$	1	2	<u>(3)</u>
21. Aquatic Mollusks	0	1	2	(3)
22. Fish	0	0.5	1	(1.5)
23. Crayfish	0	0.5	1	(1.5)
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	<u> </u>	FACW = 0.75; (	OBL = 1. Other = 0	$\sim$
*perennial streams may also be identified using other methods.	See p. 35 of manua			
Notes: Highly channelized perennial stream/river that			Field Sheet 01-STF	R-03 - 4 Mile
Run Stream.				
Sketch: Developed 70 7 7 4 Mile Run GO 8			Polamac	
Developed of Area	P		_	

Ĺ		roject Name	For use in	wadeable chan			ginia								
N/A Name(		roject Name			nels classified a Cowardin	s intermittent or		CAD#	Impact/SAR	Impact					
Name(	DC2RVA - Area 0		DC2RVA - Area					Locality	Class.	HUC	Date	SAR #	length	Factor	
Ĺ	(s) of Evaluate			VA e and Informa	R2SB3	02070010	11/03/2015								
	L. Eggering	01(3)	Stream Nam	e and imornia	02-STR-02 (Taylor Run)										
		s the cross-sec	tion of the stream	and prevailing condition (erosion, aggradation)			(Taylor I	(uii)							
	Optir				Conditional Catego		Po	or	Sev	rere					
ľ	- Optin	ilai	A	ptima.	Ж	giriai	N.		///						
	" Lake	خلا	1	<u>J</u>		less than Severe or	Overwiden		1	5					
Condition	floodplain or fully	ks. Vegetative or natural rock, 0%). AND/OR ankfull benches s to their original developed wide	erosion or unproted of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel	ew areas of active cted banks. Majority table (60-80%). ition or natural rock 80%) AND/OR ures contribute to akfull and low flow II defined. Stream to bankfull benches,	or Poor due to lo Erosion may be pro both banks. Veget 40-60% of banks. bevertical or unde 60% of strean sediment. Sec	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient. contribute	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment.	Deeply incised vertical/lateral in: incision, flow con banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre	stability. Severe itained within the ad below average najority of banks ut. Vegetative on less than 20% of eventing erosion.					
	floodplain or fully developed wide		or newly develope portions of the r sediment cover	of floodplains along each. Transient s 10-40% of the bottom.	instability. Deposition stability, may be AND/OR V-shap vegetative protecti banks and depositi	on that contribute to forming/present. ed channels have on on > 40% of the ional features which to stability.	nature, and contrit AND/OR V-shape vegetative protecti 40% of the bar sediment depos	outing to instability. ed channels have on is present on > hks and stable	Obvious bank slo Erosion/raw ban AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	ks on 80-100%. g channel. Greater bed is covered by uting to instability. channels and/or					
Score	3			.4		2	1.		s section is						
. RIPARIAN			Con	ditional Cate	gory		ts of length & widt		notes>>						
-	Optir	nal	Subo	ptimal	Mar	ginal Low Marginal:	Po	or							
Riparian	Free stratum (dbh > with > 60% tree car non-maintained und located within the	nopy cover and a erstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a href="40">30%</a> tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.							
			High	Low	High	Low	High	Low							
Condition Scores	1.5	5	1.2	1.1	0.85	0.75	0.6	0.5							
escriptors.  Determine squaelow.	ian areas along e are footage for ea parian Area and S	ch by measurin	g or estimating le	ngth and width. (	Calculators are pr	· ·	Ensure the of % R	iparian							
Right Bank	% Riparian Area>	5%	95%					100%							
3	Score >	0.6	0.5						CI= (Sum % RA * Se	cores*0.01\/2					
Left Bank	% Riparian Area>	5%	95%					100%	Rt Bank CI >	0.51					
	Score >	0.6	0.5						Lt Bank CI >	0.51					
	HABITAT: Value oot mats; SAV; rif				ody and leafy deb	oris; stable substr	ate; low embeded	lness; shade;	NOTES>>	-					
Instream				Conditiona			1								
Habitat/	Optir	nal		ptimal ments are typically		ginal ments are typically	Po Habitat elements								
Available  - Cover	Habitat elements are in greater than 50		present in 30-50% are adequate fo	6 of the reach and r maintenance of	present in 10-30% are adequate fo	% of the reach and r maintenance of	lacking or are ur elements are typica	nstable. Habitat ally present in less							
	1.5		popul 1	ations.		ations.	than 10% of	f the reach.							

Alteration  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  The stream reach is disrupted by any disrupted by any of the channel unaltered pattern or has naturalized.  The stream reach is the parameter guidelines. If guidelines. If stream has been unaltered pattern or has naturalized.  The stream reach is the parameter guidelines. If stream has been stream has bee	/2015 02-STR-02	SAR length	Impact Factor
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, cha embankments, spoil piles, constrictions, livestock    Conditional Category			
Channel Alteration  Channel a unaltered pattern or hardening absent. Stream has a unaltered pattern or has naturalized.	nannelization,		
Channel Alteration  Channel value and the pattern of has naturalized.  Channel value and the pattern of has naturalized.  Alteration  Alteration  Channelization, dredging, alteration, unaltered pattern or has naturalized.  Alteration value and pattern of has naturalized.  Alteration value and pattern of has naturalized.  Alteration value and va	Severe	NOTES>>	
the parameter guidelines. the parameter guidelines. guidelines. guidelines. guidelines. the parameter guidelines. guidelines. the parameter guidelines the parameter guidelines the parameter guidelines. The parameter guidelines the parameter guidelines the parameter guidelines. The parameter guidelines the parameter guidelines the parameter guidelines. The parameter guidelines the parameter guidelines the parameter guidelines. The parameter guidelines the parameter guidelines the parameter guidelines the parameter guidelines. The parameter guidelines guidelines guidelines guidelines guidelines guidelines guidelines guidelines guidelines gu	er than 80% of reach is ed by any of the channel ns listed in the parameter as AND/OR 80% of banks d with gabion, riprap, or cement.		
SCORE 1.5 1.3 1.1 0.9 0.7	0.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

INSERT PHOTOS:



NC DWQ Stream Identification Form	Version 4.11	Taylor Rur	02-	STR-02
Date: 11/03/2015	Project/Site: D	C2RVA - Area 02	Latitude: 38.80	04564
Evaluator: L. Eggering	County: Fairfa	x	Longitude: 77.	075089
<b>Total Points:</b> 34 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nination (circle one) ermitten Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 14.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,		1		2
ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel		lo = 0	Yes	= 3
a artificial ditches are not rated; see discussions in manual		<u> </u>		
B. Hydrology (Subtotal = $\frac{7}{}$ )				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	<u> </u>	1.5
17. Soil-based evidence of high water table?		lo = 0	Yes	
C. Biology (Subtotal = 12.5)				
18. Fibrous roots in streambed	(3)	2	1	0
Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	<del>- 9</del> -	1	(2)	3
21. Aquatic Mollusks	Ő	1		3
22. Fish		0.5	1	1.5
23. Crayfish	Ö	0.5	1	1.5
24. Amphibians		0.5	1	1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed	0	FACW = 0.75 OB	L = 1.5 Other = 0	
	ada Caan 25 of many		L = 1.5 Diner = 0	)
*perennial streams may also be identified using other meth Notes: Macroinvertabrets observed: hydropsycio			innow cizod fich	
Notes: Macroinvertablets observed. Hydropsych	ade, iiatwoiiiis, wa	ter striders. Marry III	IIIIIOW SIZEU IISII	l.
Field Sheet 01-STR-01, no evaluator liste		)	A ×	
Sketch:	Culvert Air	Box Culvert		起
	obser point		~100 Feet	

		Stre					ı (Fori	m 1)			
				fied Stream N wadeable chan							
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area	-	VA	R4SB3	02070010	11/3/15				
	e(s) of Evaluat	ng, W. Moorhead		e and Informa	ation	00.07	TD 00				
							ΓR-03				
Channel	Condition: Asse			C	onditional Catego	ry					
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	/ere	
	"	Who have	Slightly incised for	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		Desply instead	(or excavated),	
Channel Condition	Very little incision or 100% stable bar surface protectior prominent (80-11 Stable point bars/h are present. Acce- floodplain or fully bankfull benches.	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches as to their original developed wide Mid-channel bars,	erosion or unproted of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to	cted banks. Majority table (60-80%). tion or natural rock- -80%) AND/OR tures contribute to hkfull and low flow Il defined. Stream o bankfull benches, d floodplains along	or Poor due to lo Erosion may be pro both banks. Veget 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Major are near vertical. E 60-80% of bank protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib	ority of both banks rosion present on its. Vegetative on 20-40% of fficient to prevent its 60-80% of the id by sediment.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, n vertical/underc protection present of banks, is not pre	istability. Severe ntained within the ed below average najority of banks cut. Vegetative on less than 20% of eventing erosion. oughing present.	
	and transverse ba sediment deposition 10% of b	n covers less than	portions of the r sediment cover	reach. Transient rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have ion on > 40% of the ional features which to stability.	AND/OR V-shape vegetative protectic 40% of the ban sediment depos	on is present on > ks and stable	AND/OR Aggradin than 80% of stream deposition, contrib Multiple thread	g channel. Greater n bed is covered by	CI
Score	3	3	2	.4	:	2	1.	6	1	1	2.4
1012077		,	ou,oo. o.	uic bains ai	to wen vege	tated. 100 t	ip/downstrea	am. Field S	02 0	\-00.	
	N BUFFERS: A	Assess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep	table)	Right bank:	
RIPARIAI		Assess both bank imal  - 3 inches) present, inopy cover and a ferstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy covered a	e entire SAR. (roo	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained		h may be accepor	NOTES>> F Railroad yar poor. Left k pavement a buildings = old field gra = high marg	Right bank: rd = low, pank: nd low poor, assy slope	
RIPARIAI Riparian	Opti  Tree stratum (dbh > with > 60% tree canon-maintained unc	Assess both bank imal  - 3 inches) present, inopy cover and a ferstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	NOTES>> F Railroad yar poor. Left k pavement a buildings = old field gra = high marg	Right bank: rd = low, pank: nd low poor, assy slope	
RIPARIAI Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree canon-maintained unc	Assess both bank imal  3 inches) present, anopy cover and a berstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, active feed conditions.	NOTES>> F Railroad yar poor. Left k pavement a buildings = old field gra = high marg	Right bank: rd = low, pank: nd low poor, assy slope	
Riparian Buffers  Condition Scores  Delineate rip sociptors. Determine so	Opti  Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the	assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> F Railroad yar poor. Left k pavement a buildings = old field gra = high marg	Right bank: rd = low, pank: nd low poor, assy slope	
RIPARIAI Riparian Buffers  Condition Scores Delineate ripsecriptors. Determine sclow. Enter the %	Opti  Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> F Railroad yal poor. Left k pavement a buildings = old field gra = high marg	Right bank: rd = low, pank: nd low poor, assy slope ginal	
Riparian Buffers  Condition Scores  Delineate rip socriptors. Determine solow. Enter the %	Opti  Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the locate	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 90%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> F Railroad yar poor. Left k pavement a buildings = old field gra = high marg	Right bank: rd = low, pank: nd low poor, assy slope ginal	CI
RIPARIAI Riparian Buffers  Condition Scores  Delineate rip Scriptors. Determine sclow. Enter the %	Tree stratum (dbh > with > 60% tree canon-maintained unch located within the located with	sssess both bank imal  3 inches) present, anopy cover and a dierstory. Wetlands er ilparian areas.  5 each stream ban ach by measurin Score for each r 10% 0.85	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 90% 0.5	an areas along the ditional Categories and Congth and width. Categories and Congth and Categories a	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> F Railroad yal poor. Left k pavement a buildings = old field gra = high marg	Right bank: rd = low, oank: nd low poor, assy slope jinal	CI 0.60
RIPARIAI Riparian Buffers  Condition Scores Delineate rip scriptors. Determine scow. Enter the % Right Bank Left Bank	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	Assess both bank  imal  3 inches) present, nopy cover and a Jerstoy. Wetlands er iparian areas.  5  each stream ban ach by measurin Score for each r 10% 0.85  10% 1.1	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 90% 0.5	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 1.5)  40%  0.5  by and depths; wores.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prove.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ex	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums sparian qual 100 100%	NOTES>> F Railroad yal poor. Left k pavement a buildings = old field gra = high marg  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	Right bank: rd = low, oank: nd low poor, assy slope jinal	
RIPARIAI Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine sclow. Enter the % Right Bank  Left Bank  INSTREAI dercut banks;	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	Assess both bank  a 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measuring Score for each range of the stream bank and the stream	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 90% 0.5	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and County and the blocks below  40%  0.5  by and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the control of the con	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (6th > 3 inches) present, with <a>20</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> F Railroad yal poor. Left k pavement a buildings = old field gra = high marg  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	Right bank: rd = low, poank: nd low poor, assy slope ginal  cores'0.01//2 0.54 0.66	
RIPARIAI Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine sclow. Enter the % Right Bank  INSTREAI dercut banks; Instream Habitat/ Available	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	Assess both bank  a 3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5  Beach stream ban each by measurin 10% 0.85  10% 1.1  arried substrate si fflie poole complet imal re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 90% 0.5  50% 0.7  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (congth and width. (congth and width.)  40%  0.5  by and depths; wo res.  Conditional  ments are typically & of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (6th > 3 inches) present, with					

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point Project # Date SAR length Impact Factor N/A CSX R4SB3 02070010 11/3/15 02-STR-03 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> Enter stretch embankments, spoil piles, constrictions, livestock channelized. Conditional Category Moderate Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. SCORE 1.5 1.3 1.1 0.9 0.7 0.5 0.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

INSERT PHOTOS:





Top Left: Typical view downstream Top Right: Typical view upstream

Bottom Left: Typical view of stream along railroad

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: November 3, 2015

02-STR-03

Latitude: 38.805794

Evaluator: L. Eggering, W. Moorhead	County: Fairfax		Longitude: -77	'.089461
<b>Total Points:</b> 24.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermittent) Perennial	Other e.g. Quad Name:	
	<u>'</u>		1	
A. Geomorphology (Subtotal = $8.5$	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
Sinuosity of channel along thalweg	(0)	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	(0)	0.5	1	1.5
11. Second or greater order channel	No	0 = (0)	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual	<u>.</u>			
B. Hydrology (Subtotal = $7.5$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes :	<del>(</del> 3)
C. Biology (Subtotal = $8.75$ )	-	•		
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = (0.75) OBI	L = 1.5 Other = 0	)
*perennial streams may also be identified using other method				
Notes: Ditch between railroad yard and industrial	l park. Field Sheet	02-STR-08.		
Sketch:	vegetation			

railroad yard

		Stre	Uni	SSESS fied Stream N	lethodology f	or use in Virg	ginia				
Project #		Project Name		wadeable chan	Cowardin	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact	
N/A		2RVA - Area		VA	Class. R4SB	02070010	11/3/15	OAK#	length	Factor	
	ne(s) of Evaluat			e and Informa		02070010	11/3/13				
L. Egg	jering, W. Mo	orhead				02-S	ΓR-04				
. Channel C	Condition: Asse	tion: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)  Conditional Category									
	Opti	imal	Subo	ptimal				Poor S		ere	
	1	AND PARKET	1			less than Severe or	Overwiden		1	5	
Channel Condition	Innel Idition  Very little incision or active erosion; 80- 10% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than		erosion or unproted of banks are stylegetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to rnewly develope	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, dfloodplains along reach. Transient	or Poor due to lo Erosion may be pn both banks. Vege: 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran instability. Depositio stability, may be	stable than Severe wer bank slopes. essent on 40-60% of tative protection on Streambanks may errut. AND/OR 40- in is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is inst. erosion. AND/OI stream is cover Sediment is temp nature, and contril AND/OR V-shapp	ority of both banks crosion present on ks. Vegetative to 20-40% of fficient to prevent R 60-80% of the dby sediment. orary/transient in buting to instability. dc channels have	vertical/lateral in incision, flow cor banks. Streamber rooting depth, n vertical/underc protection present banks, is not pre Obvious banks lerosion/raw bar	(or excavated), stability. Severe tatained within the ad below average najority of banks tut. Vegetative on less than 20% of eventing erosion. bughing present. tks on 80-100%. g channel. Greater	
	and transverse bars rew. Transient		stream	rs 10-40% of the bottom.	vegetative protecti banks and depositi contribute	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depor	nks and stable sition is absent.	deposition, contrib Multiple thread subterrar		С
Score	3	3	2	.4	:	2	1.	6	,	l	2.0
. RIPARIAI	N BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	h may be accep	table)		
. RIPARIAI	N BUFFERS: A		Con	an areas along the ditional Category ptimal	gory	ginal	Po		table)		
RIPARIAI Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained					
Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cateceptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti Tree stratum (dbh > with > 60% tree ca	imal  3 inches) present, anopy cover and a defestory. Wellands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Categorium Low Suboptimal:  Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory.  Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine so	Tree stratum (dbh > with > 60% tree ca	imal  3 inches) present, enopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorian Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine so	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	imal  3 inches) present, anopy cover and a destroy. Wellands e riparian areas.  5  each stream ban each stream ban each by measurin Score for each rips%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in 95%	ditional Categorian Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow.	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	imal  3 inches) present, anopy cover and a deferstory. Weltands e riparian areas.  5.5  each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in	ditional Categorian Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100	NOTES>>	cores*0.011/2	
Condition Scores  Delineate ripescriptors. Determine scelow. Enter the %  Right Bank	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	imal  3 inches) present, anopy cover and a destroy. Wellands e riparian areas.  5  each stream ban each stream ban each by measurin Score for each rips%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in 95%	ditional Categorian Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100		cores*0.01)/2 0.52	С
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine scelow. Enter the % Right Bank	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	imal  3 inches) present, anopy cover and a destroyr. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each ri  5%  0.85	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 95% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are proven.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, traits, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >  Lt Bank CI >	0.52 0.57	C: 0.5
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % Right Bank  Left Bank	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	5  sach stream ban ach by measurin 5% 0.85 20% 0.85 aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 95% 0.5  80% 0.5  zes, water velocii	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Accident Scores us Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, traits, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	0.52 0.57 Narrow	
Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % Right Bank Left Bank INSTREAI	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	imal  3 inches) present, anopy cover and a dierstory. Wetlands er riparian areas.  5  each stream ban each by measurin  5%  0.85  20%  0.85  aried substrate sifffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 95% 0.5  80% 0.5  zes, water velocit exes, stable featu	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Accident Scores us Calculators are proved the service of the s	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t     of % R     Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100 100%	CI= (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>> I range of co but largely s	0.52 0.57 Narrow nditions, shaded and	
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine scelow. Enter the % Right Bank  Left Bank Left Bank INSTREAI ndercut banks; Instream Habitat/ Available	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands er fiparian areas.  5  each stream ban each by measurin  5%  0.85  20%  0.85  aried substrate si fiftle poole completimal  re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 95% 0.5  80% 0.5  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditional  ments are typically who free reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided and leafy details and leafy detai	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically & of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % Reserved Blocks estable Blocks	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or lots romparable conditions.  Low 0.5  Low 100%  100%  100%  100%	CI= (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>> I range of co	0.52 0.57 Narrow nditions, shaded and	
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine so elow. Enter the % Right Bank  Left Bank  Instream Habitat/	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands er iparian areas.  5  each stream ban each by measurin  Score for each ri  5%  0.85  20%  0.85  aried substrate si iffle poole completimal  re typically present 0% of the reach.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 95% 0.5  80% 0.5  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. ( In the blocks below  ty and depths; wo res.  Conditiona ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%  100%  100%	NOTES>>  Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl> NOTES>> I range of co but largely s stable in pro	0.52 0.57 Narrow nditions, shaded and	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Date Data Point SAR length Project # Impact Factor N/A CSX R4SB 02070010 11/3/15 02-STR-04 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> Man-made Conditional Category Moderate embankments, spoil piles, constrictions, livestock straight ditch. Some sinuosity between 2 Negligible Minor Severe slopes. 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. is disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has been guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. SCORE 1.5 0.5 0.70 1.3 1.1 0.9 0.7 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF

**INSERT PHOTOS:** 





Top Left: View of Culvert 03 Top Right: View of Culvert 03 **Bottom Left: View of Culvert 04** 

NC DWQ Stream Identification Form Version 4.11

02-STR-04

Date: November 3, 2015	Project/Site: DC2RVA - Area 02	Latitude: 38.806146
Evaluator: L. Eggering, W. Moorhead	County: Fairfax	Longitude: -77.093775
Total Points: 21 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 6.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 =(0)	Yes :	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual  B. Hydrology (Subtotal = 5.5)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0)	1	2	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes :	€3)
C. Biology (Subtotal = 9	_			_
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = (1.5) Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet 02-STR-09.

Old pavement / weeds

Sketch:

vegetation

Project Name			Stre	Unit	fied Stream N	ment lethodology f	or use in Virg	jinia	m 1)			
Name(s) of Evaluator(s)  L. Eggering, W. Moorhead  Condition: Assess the cores and emotion and private files are assess assigned to the second of the attention and providing grantition (emotion). Agging the process or arise of the attention and providing grantition (emotion). Agging the process or arise of the attention and providing grantition (emotion). Agging the process or arise of the attention and providing grantition (emotion). Agging the process or arise of the attention and providing grantition (emotion). Agging the process or arise of the attention of the attention and providing grantition (emotion). Agging the process or arise of the attention of the	D		Drainet News						CAD#	Impact/SAR	Impact	
L. Eggerfing, W. Moorhead  1. Channel Condition:  Condition  Condi	•		-		,				SAR#	length	Factor	
L. Eggering, W. Moorhead  Opimal  Nationa respective processing pro							02070010	11/3/15				
Channel Condition: Assess the cross-section of the atteam and prevailing condition (proxion, aggradation) Condition		. ,	. ,	Otrouii Huiii	o una miorini							
Channel Condition  Very little inclaim of aetitive evolution (a)  From the service of the condition of aetitive evolution (a)  From the service of the condition of aetitive evolution (a)  From the service of the condition of aetitive evolution (a)  From the condition of aetitive evolution (a)  From the service of the condition of aetitive evolution (a)  From the service of the condition of aetitive evolution (a)  From the service of the condition of aetitive evolution (a)  From the service of the condition of aetitive evolution (a)  From the service of the condition of aetitive evolution (a)  From the service of t	. Channel C	ondition: Asse	ess the cross-sec	tion of the stream	and prevailing c	ondition (erosion,						
Channel Condition  Tree stratum (bb - 3 inches) passen, but erroring to the form of the protein of the stratum		Opti	imal	Subo				Po	or	Sev	vere	
Channel Condition  Wey lettle nection or active encourse, the processor of the control of the processor of t		1	W.	1						1	5	
Score 3 2.4 2 1.6 1  NOTES>> Bed is coarse, but eroding vertical banks are frequent. 100' up/downstream. Field Sheet 02-STR-07.  Riparian Buffers  Conditional Category  Optimal Suboptimal Regards areas  Suboptimal Regards areas  Optimal Suboptimal Regards areas  Suboptimal Regards areas  Optimal Suboptimal Regards areas  Optimal Regards areas  Optimal Regards areas  Optimal Regards areas  Suboptimal Regards areas  Optimal Regards ar		100% stable bal surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	inks. Vegetative on or natural rock, 100%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60-Depositional feat stability. The bar channels are wellikely has access to or newly develope portions of the r	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositiv stability, may be	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj are near vertical. It 60-80% of ban protection prese banks, and is insu erosion. AND/O stream is cover Sediment is temp nature, and contril AND/OR V-shap	ority of both banks Frosion present on ks. Vegetative nt on 20-40% of officient to prevent R 60-80% of the ad by sediment. overay/transient in outing to instability, ad channels have	vertical/lateral in incision, flow cor banks. Streambly rooting depth, n vertical/underc protection present banks, is not pre Obvious banks lerosion/raw bar	stability. Severe tained within the ed below average najority of banks cut. Vegetative on less than 20% of eventing erosion. oughing present. iks on 80-100%.	
Riparian areas along each stream bank in Condition Categories and Condition Scores   1.5   1.1   0.5   1.1   0.5   1.1   0.5   1.1   0.5   1.1   0.5   1.1   0.5   1.1   0.5   1.1   0.5   0.6   0.5   1.1   0.5   0.6   0.5   1.1   0.5   0.6   0.5   0.5   0.6   0.5   0.5   0.6   0.5   0.5   0.6   0.5   0.5   0.6   0.5   0.5   0.6   0.5   0.5   0.6   0.5   0.5   0.6   0.5   0.5   0.6   0.5   0.5   0.6   0.5   0.5   0.6   0.5   0.5   0.6   0.5						vegetative protecti banks and depositi	on on > 40% of the ional features which	40% of the ba	nks and stable	deposition, contrib Multiple thread	outing to instability. channels and/or	CI
Conditional Category  Riparian Buffers  Riparian Buffers  Riparian reas- Riparian reas- Riparian reas- Buffers  Riparian reas- Riparian reas- Riparian reas- Riparian reas- Buffers  Riparian reas- Riparian reas- Riparian reas-  Riparian re	Score	3	3	2	.4	:	2	1.	.6		1	2.0
Riparian Buffers  Buffers  Interestation (bit h - 3 inches) present, with 30% tree canopy occer and a non-maintained understory. Wetlands located within the riparian areas.  Interestation (bit h - 3 inches) present, with 30% tree canopy occer and a non-maintained understory. Wetlands located within the riparian areas.  Interestation (bit h - 3 inches) present, with 30% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.  Interestation (bit h - 3 inches) present, with 30% tree canopy cover and shrub layers or a non-maintained understory.  Interestation (bit h - 3 inches) present, with 30% tree canopy cover with 40% 30% tree canopy c		Opti	imal	High Suboptimal: Riparian areas with tree stratum	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches)	Marginal: Non-maintained, dense herbaceous	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas	High Poor: Lawns, mowed, and maintained areas, nurseries;	Low Poor: Impervious surfaces, mine	banks are w vegetated w shrubs, and unmanaged	vell vith trees, I I herbs.	
Condition Scores  1.5  1.2  1.1  0.85  0.75  0.6  0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the escriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you elow. Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank  % Riparian Area> 20% 80% 100% Score > 1.1  0.5  Cl= (Sum % RA * Scores*0.01)/2  Left Bank Score > 0.85  0.5  INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; ndercut banks; root mats; SAV; riffle poole complexes, stable features.  Conditional Category  Instream Habitat/ Available Habitat elements are typically present in 30-50% of the reach and present in 10-30% of the reach and p		with > 60% tree ca non-maintained und	anopy cover and a derstory. Wetlands	present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	30% tree canopy cover and a maintained understory. Recent cutover (dense	either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	denuded surfaces, row crops, active feed lots, trails, or other comparable	ballast on le	eft side,	
Scores  1.5 1.2 1.1 1.8 1.2 1.1 1.8 1.8 1.2 1.1 1.8 1.8 1.8 1.1 1.8 1.8 1.8 1.8 1.8	Condition			-						_		
Ensure the Suris of % Riparian elev.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank  Mediparian Area and Score for each riparian category in the blocks below.  Blocks equal 100  Cl= (Sum % RA * Scores*0.01)/2  Cl= (Sum % RA * Scores*0.01)/2  Right Bank  Mediparian Area and Score for each riparian category in the blocks below.  Cl= (Sum % RA * Scores*0.01)/2  Right Bank  Mediparian Area and Score for each riparian category in the blocks below.  Cl= (Sum % RA * Scores*0.01)/2  Right Bank  Cl= (Sum % RA * Scores*0.01)/2  Right Bank Cl > 0.62  Lit Bank Cl > 0.68  INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafly debris; stable substrate; low embededness; shade; ndercut banks; root mats; SAV; riffle poole complexes, stable features.  Cobble/gravel nice looking bed; pools not well developed. Woody and leafly debris absent, no present in 30-50% of the reach and present in 10-30% of the reach and present in 10-30% of the reach and lacking or are unstable. Habitat elements absent, no		1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
Right Bank Score > 1.1 0.5 Cl= (Sum % RA * Scores*0.01)/2  Left Bank % Riparian Area> 50% 50% 100% Rt Bank Cl> 0.62  Left Bank Score > 0.85 0.5 Lt Bank Cl> 0.68  INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafty debris; stable substrate; low embededness; shade; cobble/gravel nice looking bed; pools not well developed. Woody Available Habitat elements are typically present in 30-50% of the reach and Available Habitat elements are typically present in 30-50% of the reach and present in 10-30% of the reach and debris absent, no	escriptors.  Determine squelow.	uare footage for e	each by measurin	g or estimating le	ngth and width. (	Calculators are pr	· ·	of % R	liparian qual 100			
Left Bank    Score   0.85   0.5	Right Bank								100%	-		
Score > 0.85 0.5 Lt Bank Cl > 0.68  INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; ndercut banks; root mats; SAV; riffle poole complexes, stable features.  Cobble/gravel nice looking bed; pools not well developed. Woody and leafy debris; stable substrate; low embeddeness; shade; cobble/gravel nice looking bed; pools not well developed. Woody debris absent, no		. B	F00/	F00/					4000/	<u> </u>		<u> </u>
INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; ndercut banks; root mats; SAV; riffle poole complexes, stable features.  Cobble/gravel nice looking bed; pools not well developed. Woody Available  Available  NOTES>>  Cobble/gravel nice looking bed; pools not well developed. Woody Abitate elements are typically present in 30-50% of the reach and present in 10-30% of the reach and pre	Left Bank								100%			0.65
Instream Habitat/ Available    Conditional Category   Iooking bed; pools not well developed. Woody are present in 30-50% of the reach and present in 10-30%	. INSTREAM	/ HABITAT: Va	aried substrate si	zes, water velocit	y and depths; wo	ody and leafy deb	oris; stable substr	ate; low embeded	Iness; shade;	NOTES>>		2.03
Habitat/ Available  Optimal Suboptimal Marginal Poor  Stable habitat elements are typically present in 30-50% of the reach and present in 10-30% of the reac				1	Conditiona					_		
AVAIIABLE Habitat elements are typically present present in 30-50% of the reach and present in 10-30% of the reach and lacking or are unstable. Habitat depris absent, no	Habitat/	Opti	imal							well develo	ped. Woody	
Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of are adequate for maintenance of elements are typically present in less diversity in water	Available Cover			present in 30-50% are adequate fo	% of the reach and r maintenance of	present in 10-30% are adequate fo	% of the reach and r maintenance of	lacking or are uselements are typic	nstable. Habitat ally present in less		-	
populations. populations. than 10% of the reach.  Score 1.5 1.2 0.9 0.5 depths.		1	.5					than 10% o	f the reach.	_		0.90

	St	ream In	npact A	ssessm	ent Fo	rm Pag	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB3	02070010	11/3/15	02-STR-05		
	_ ALTERATION: Stream cross poil piles, constrictions, livestock  Negligible			al Category	straightening of cl		zation,	NOTES>> alteration o	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/6 shored with ga	80% of reach is ny of the channel I in the parameter OR 80% of banks abion, riprap, or nent.	(evidently d	lecades

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Typical view of stream
Top Right: View upstream toward culvert
Bottom Left: View from culvert downstream
Bottom Right: View upstream toward culvert

NC DWQ Stream Identification Form Version 4.11

02-STR-05

Date: November 3, 2015	Project/Site: DC2RVA - Area 02	Latitude: 38.807525
Evaluator: L. Eggering, W. Moorhead	County: Fairfax	Longitude: 77.099439
<b>Total Points:</b> 33.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent (Perennial)	Other e.g. Quad Name:

0 (0) (1.5)	Weak  1 1 1 1 1 1 0.5 0.5 0 = 0	Moderate  2 2 2 2 2 2 2 2 2 1 1 1 Yes =	Strong  3 3 3 3 3 3 3 4 5 6.5 6.5
0 0 0 0 0 0 0 0 0 0 0 0	1 1 1 1 1 1 0.5 0.5 0 = 0	2 2 2 2 2 2 2 2 1 1 1 Yes =	3 3 3 3 3 3 3 (.5)
0 0 0 0 0 0 0 0 0 0 0 0	1 1 1 1 1 1 0.5 0.5 0 = 0	2 2 (2) 2 2 2 2 1 1 1 Yes =	3 3 3 3 3 3 (.5)
0 0 0 0 0 0 0 0 0 0	1 1 1 (1) (1) 1 0.5 0.5 0 = 0	2 2 2 2 2 2 1 1 1 Yes =	3 3 3 3 3 (.5)
0 0 0 0 0 0 0 0 0 0	1 1 (1) (1) 1 0.5 0.5 0 = 0	(2) 2 2 2 2 1 1 1 Yes =	3 3 3 3 (.5) (.5)
0 0 0 0 0 0 0 0	1 (1) (1) (1) (1) (1) (0.5) (0.5) (0.5) (0.5) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	2 2 2 2 1 1 1 Yes =	3 3 3 (1.5)
0 0 0 0 0 No 0	1 0.5 0.5 0 = 0	2 2 2 1 1 Yes =	3 3 (.5) (.5)
0 0 0 0 No 0	1 0.5 0.5 0 = 0	2 2 1 1 Yes =	3 3 (.5) (.5)
0 0 0 0 0 0 (1.5)	1 0.5 0.5 0 = 0	2 1 1 Yes =	(.5)
0 0 0 0 0 0 (0) (1.5)	0.5 0.5 0 = 0	1 1 Yes =	(.5)
0 0 0 0 (1.5)	0.5 0 = 0	1 Yes =	(.5)
0 (0) (1.5)	0 = 0 1 1	Yes = 2 2	(.5)
0 (0) (1.5)	1 1 1	2 2	
(1.5) (0)	1	2	3
(1.5) (0)	1	2	3
(1.5) (0)	1	2	3
(1.5) (0)	1		
0		0.5	3
		0.5	0
	0.5	1	1.5
0	0.5	(1)	1.5
N	0 = 0	Yes =	(3)
(3)	2	1	0
(3)	2	1	0
0	1	(2)	3
0	(1)	2	3
0	0.5	(1)	1.5
0	(0.5)	1	1.5
0	(0.5)	1	1.5
(0)	0.5	1	1.5
	FACW = 0.75; C	DBL = 1.5 Other = 0	
35 of manua	al.		
dids, snail	s, water striders;	oretty-looking strea	am in
dorless Fi	eld sheet: 02-STR	R-07.	
<b>Q</b>	other track	<i>.</i>	
(	0 0 0 0 0 0	0	0

access road

		Stre		SSESS fied Stream M			) (For	m 1)			
				wadeable chan	nels classified a						
Project #		Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area		VA e and Informa	R2SB	02070010	11/3/15				
	e(s) of Evalua ering, W. Mo	. ,	Stream Nam	e and imornia	ation	02-97	ΓR-06				
			tion of the stream	and prevailing of	ondition (erosion, aggradation)		N-00				
ii onamore		imal			ondition (erosion, aggradation) onditional Category  Marginal		Poor		Severe		
	- Opti	IIIIai	Jubo	ptimai	IVIGI	giriai	N N		Jev	ere //	
	"	- MAR	T		Often incised, but	less than Severe or	Overwidene	ed/incised.	1	5	
Channel Condition	Very little incision or active erosion; 8t 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient		erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to	ew areas of active cted banks. Majority table (60-80%). tion or natural rock :80%) AND/OR ures contribute to ikfull and low flow II defined. Stream bankfull benches, d floodplains along	or Poor due to lo Erosion may be pro both banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Set temporary/tran	stable than Severe wer bank slopes. esent on 40-60% of lative protection on Streambanks may wrcut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the by sediment. orary/transient in	Deeply incised vertical/lateral ins incision, flow con banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious bank slc Erosion/raw bank	stability. Severe itained within the sid below average najority of banks ut. Vegetative on less than 20% of eventing erosion. pughing present.	
			portions of the r sediment cover	s 10-40% of the bottom.	stability, may be AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the onal features which to stability.	AND/OR V-shape vegetative protection 40% of the bar	ed channels have on is present on > oks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	g channel. Greater n bed is covered by uting to instability. channels and/or	c
Score	3	3	2	.4	;	2	1.	6	1		2.
NOTES>> 2. RIPARIAN	N BUFFERS: A	Assess both bank	c's 100 foot riparia	in areas along the	STR e entire SAR. (ro		ts of length & widt	th may be accep	table)		
	Opti	imal		ditional Cateo		ginal	Po	or	NOTES>>		
Riparian Buffers	Tree stratum (dbh :	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely	Low Poor: Impervious surfaces, mine spoil lands, denuded			
			shrub layers or a non-maintained understory.	understory. Recent cutover (dense vegetation).	inches) present, with <30% tree canopy cover.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Condition	1	5	shrub layers or a non-maintained understory.	Recent cutover (dense vegetation).	inches) present, with <30% tree canopy cover.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Scores  1. Delineate ripadescriptors. 2. Determine sobelow.	arian areas along quare footage for e Riparian Area and % Riparian Area>	each by measurin Score for each r	shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 70%	Low 1.1 ategories and Congth and width. (1)	inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
Scores  1. Delineate ripa descriptors. 2. Determine so pelow. 3. Enter the % F	arian areas along quare footage for e Riparian Area and	each stream ban each by measurin Score for each r	shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in	Low 1.1 ategories and Congth and width. (1)	inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	Cl⇒ (Sum % RA * St	cores*0.01)/2	
Scores  1. Delineate ripadescriptors. 2. Determine sobelow. 3. Enter the % F	arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	each stream ban each by measurin Score for each r 30% 0.85	shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 70% 0.5	Low 1.1 ategories and Congth and width. (1)	inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	Rt Bank CI >	0.61	C
Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Va root mats; SAV; r	each stream ban each by measurin Score for each r 30% 0.85  20% 0.85  aried substrate si	shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 70% 0.5  80% 0.5	Low 1.1  ategories and Congth and width. (an the blocks below	High  0.85  Indition Scores us calculators are prov.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	vegetated non- maintained area, recently seeded  and stabilized, or other comparable  condition.  High  0.6  Ensure tt  of % R Blocks et	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums liparian qual 100  100%  100%  ness; shade;	Rt Bank CI > Lt Bank CI > NOTES>> H nearly 100% sand. Short	0.61 0.57 abitat gravelly t riffles and	C 0.8
Scores  1. Delineate ripadescriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank  3. INSTREAI	arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Va root mats; SAV; r	each stream ban each by measurin 30% 0.85  20% 0.85  aried substrate si iffle poole completimal re typically present	shrub layers or a non-maintained understory.  High 1.2  k into Condition Cog or estimating le iparian category in 70% 0.5  80% 0.5  izes, water velocitiexes, stable feature Subol Stable habitat elepresent in 30-50%	Low 1.1  ategories and Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditiona	inches) present, with <30% tree canopy cover.  High  0.85 Indition Scores us calculators are prov.  I Category  Mar.  Stable habitat elepresent into elepresen	open water. If present, tree stratum (dbh >3 inches) present, with valow free canopy cover with maintained understory.  Low  0.75  sing the ovided for you	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums liparian qual 100  100%  100%  ress; shade;	Rt Bank CI > Lt Bank CI > NOTES>> H nearly 100%	0.61 0.57 abitat gravelly t riffles and All about	

	St	ream In	npact A	ssessm	ent For	m Pag	e 2			
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor	
N/A	csx		VA	R2SB	02070010	11/3/15	02-STR-06			
	ALTERATION: Stream cross poil piles, constrictions, livestock		Conditiona	I Category				NOTES>> Channelizat Culvert cros		
	Negligible	Mir	nor		erate	Sev	vere	Some mean	Ū	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0 shored with ga	30% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or nent.	between bo slopes.	ordering	
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IIS REACH			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Typical view upstream Top Right: Typical view downstream Bottom Left: View of Culvert 06 Bottom Right: View downstream

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: November 3, 2015

02-STR-06

Latitude: 38.807690

Evaluator: L. Eggering, W. Moorhead	County: Fairfax		Longitude: -77	7.101733
Total Points: 30.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle ene) ermittent (Perennial)	Other e.g. Quad Name:	:
A. Geomorphology (Subtotal = 11.5)	Absent	Weak	Moderate	Strong
1 <sup>a</sup> Continuity of channel bed and bank	0	1	2	(3)
Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0=0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 8.5				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1)	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	=(3)
C. Biology (Subtotal = <u>10.25</u> )	_			
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	11	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OBL	. = 1.5 Other = 0	)
*perennial streams may also be identified using other meth				
Notes: Railroad ditch and industrial park drainin	g watercourse. Field	d Sheet 02ASTR-06		
The same of the sa			\	
Sketch:	(III)	7.7.7.7.7.7.	CSX tracks	
Faller	reter	othe	er track	
ballast vegetation		0	S. 40 S. 50 S. 10 S.	
	n-	dirt for	$\bigcirc$	
• GPS pe	oint U-	road		
pavement & buildir	10	ds of culverts		

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
Duning4 #		Drainet Name			nels classified a	s intermittent or		CAD#	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A Nam		2RVA - Area		VA e and Informa	R1SB3	02070010	11/2/15				
	e(s) of Evalua ering, W. Mo	. ,	Stream Nam	e and imorni		ΓR-07 (	Cameron'	e Pun)			
	Condition: Asse		ction of the stream	and prevailing c			Cameron	s Kulij			
- Ondrinor C	Opti				Conditional Catego		Po	0.0	Sev	roro	
	У	illiai	Subo	pullai	Iviai	giriai	1	OI	Jan	//	
	-	WA SHOW	Slightly incised, for	ew areas of active	Poor. Banks more	less than Severe or stable than Severe		unstable. Likely to	Deeply incised	(or excavated).	
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-1) Stable point bars', are present. Acce floodplain or fully bankfull benches. and transverse be	n or natural rock, 00%). AND/OR bankfull benches as to their original developed wide Mid-channel bars,	of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR cures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes, esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be isient, contribute on that contribute to forming/present.	widen further. Majare near vertical. E 60-80% of banl protection preset banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	rosion present on ks. Vegetative nt on 20-40% of fficient to prevent & 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious bank ske Erosion/raw bank	stability. Severe tained within the do below average hajority of banks ut. Vegetative on less than 20% of eventing erosion. Doughing present. ks on 80-100%.	
		n covers less than	sediment cover	reach. Transient is 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the bar	on is present on > iks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	uting to instability.	CI
Score	3	3	2	.4		2	1.	6	1	l	3.0
RIPARIAI	N BUFFERS: A										
			Con	ditional Cate	gory		ts of length & widt		NOTES>>	Dense	
Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	*	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	ts of length & widl  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.		NOTES>> herb and sh on both side mowed law habitats bey	rub buffers es with n like	
Buffers	Optia  Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> herb and sh on both side mowed law habitats bey	rub buffers es with n like	
Buffers	Optia  Tree stratum (dbh > with > 60% tree ca	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.	NOTES>> herb and sh on both side mowed law habitats bey	rub buffers es with n like	
Condition Scores  Delineate ripescriptors. Determine so	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	simal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban ban bach by measurin Score for each r	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition Co og or estimating le iparian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> herb and sh on both side mowed law habitats bey	rub buffers es with n like	
Condition Scores  Delineate rip secriptors. Determine so solow. Enter the %	Tree stratum (dbh > with > 60% tree canon-maintained und located within the	simal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> herb and sh on both side mowed law habitats bey	rub buffers es with n like rond	
Condition Scores  Delineate rip scriptors. Determine so solow. Enter the %	Tree stratum (dbh > with > 60% tree co conon-maintained und located within the located wi	imal  3 inches) present, anopy cover and a derstory. Wetlands der liparian areas.  5  each stream ban each by measurin Score for each r 50% 0.85	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 50% 0.6	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	NOTES>> herb and sh on both side mowed lawe habitats bey	rub buffers es with n like /ond	CI
Condition Scores  Delineate rip secriptors. Determine so slow. Enter the %	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located located within the located loc	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measuring score for each r 50%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> herb and sh on both side mowed law habitats bey	rub buffers es with n like rond	CI 0.70
Condition Scores  Delineate rip sscriptors. Determine scolow. Enter the % Enter the % INSTREAL	Tree stratum (dbh > with > 60% tree cc anon-maintained und located within the located wit	imal  3 inches) present, anopy cover and a derstory. Wetlands er liparian areas.  5  each stream ban each by measurin Score for each r 50% 0.85  30% 0.85  aried substrate si	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> herb and sh on both side mowed law habitats bey  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2 0.73 0.68 Gravel,	
Condition Scores  Delineate rip escriptors. Determine sc low. Enter the %  Right Bank  Left Bank  INSTREAL	Tree stratum (dbh > with > 60% tree ca non-maintained une located within the located with	simal  3 inches) present anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measuring Score for each r 50% 0.85  30% 0.85  aried substrate siffle poole completified in the stream of the stream o	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C or or estimating le iparian category in 50% 0.6  70% 0.6  izes, water velocit exes, stable feature	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Tategories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure the of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> herb and sh on both side mowed law habitats bey  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2 0.73 0.68 Gravel, habitat is	
Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/ Available	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	simal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measuring Score for each rough to the stream of	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C or or estimating le iparian category in 50% 0.6  70% 0.6  Subo Subo Stable habitat elei present in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you  ginal ments are typically & of the reach and	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks end Block	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%	NOTES>> herb and sh on both side mowed law habitats bey  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > Cobble bed abundant, n	cores*0.01)/2 0.73 0.68 Gravel, habitat is	
Condition Scores  Delineate rip secriptors. Determine scelow. Enter the %  Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree oz non-maintained un located within the located withi	imal  3 inches) present, anopy cover and a deferstory. Wetlands deferstory. Wetlands er liparian areas.  5  each stream ban each by measuring the stream ban each by	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C  g or estimating le iparian category in 50% 0.6  70% 0.6  Subop Stable habitat ele present in 30-509 are adequate fo populi	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. (and the blocks below the blocks below the product of the blocks below the product	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substrations are typically ments are typically ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks end Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%  100%  100%	NOTES>> herb and sh on both side mowed law habitats bey  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > Cobble bed abundant, n	cores*0.01)/2 0.73 0.68 Gravel, habitat is	

	St	ream In	npact A	ssessm	ent For	m Pag	e 2		
Project#	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	csx	VA	R1SB3	02070010	11/2/15	02-STR-07			
	NEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, ts, spoil piles, constrictions, livestock  Conditional Category  Chan								
	Negligible	Mi	nor	Mod	erate	Sev	/ere	onanner and	oracion.
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0 shored with ga	30% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or nent.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View of culverts carrying stream under railroad Top Right: View upstream toward culvert under railroad Bottom Left: View downstream from culvert under railroad Bottom Right: View downstream from culvert under railroad

NC DWQ Stream Identification Form Version 4.11 Cameron Run 02-STR-07

		<u> </u>	
Date: November 2, 2015	Project/Site: DC2RVA - Area 02	Latitude: 38.805758	
Evaluator: L. Eggering, W. Moorhead	County: Fairfax	Longitude: -77.108206	
Total Points: 47 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent (Perennial)	Other e.g. Quad Name:	

A. Geomorphology (Subtotal = 25)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	2	(3)
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence				
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	(3)
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	N <sub>1</sub>	0 = 0	Yes:	(3)
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 9)	1	Г	T	
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	(1.5)
17. Soil-based evidence of high water table?	N	o = 0	Yes:	€3)
C. Biology (Subtotal = 13				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	1	(2)	3
22. Fish	0	0.5	(1)	1.5
23. Crayfish	0)	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	(1)	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other € 0	
*perennial streams may also be identified using other methods	. See p. 35 of manua	al.		
Notes: Field Sheet 02-STR-02, Cameron's Run.  Sketch:  water pool riffle			8 large culverts	

		Stre					ı (Fori	,			
				fied Stream N wadeable chan							
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Area 02			VA	R2SB	02070010	11/2/2015				
	gering, W. Moorhead		of Evaluator(s) Stream Name and Information  ng, W. Moorhead 02-STR-08								
			*:				K-06				
Channel C	Condition: Asse			C	onditional Catego	ry			1 -		
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	"Culu	All Market	Slightly incised for	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		Deeply incised	(or every steet)	
Channel Condition	Very little incision or 100% stable ban surface protection prominent (80-10 Stable point bars/t are present. Accer floodplain or fully bankfull benches.	nks. Vegetative n or natural rock, 20%). AND/OR pankfull benches as to their original developed wide	erosion or unproted of banks are s Vegetative protect prominent (60- Depositional feat stability. The bar channels are we likely has access to	cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches,	or Poor due to lo Erosion may be pro both banks. Veget 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran	wer bank slopes. esent on 40-60% of tative protection on Streambanks may rout. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to	widen further. Major are near vertical. E 60-80% of bank protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib	ority of both banks rosion present on its. Vegetative on 20-40% of fficient to prevent its 60-80% of the id by sediment.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sle	stability. Severe itained within the id below average iajority of banks ut. Vegetative on less than 20% of iventing erosion. bughing present.	
	and transverse ba sediment deposition 10% of b	rs few. Transient n covers less than	portions of the r sediment cover	d floodplains along reach. Transient rs 10-40% of the bottom.	stability, may be AND/OR V-shap vegetative protecti banks and depositi	forming/present. forming/present. ed channels have on on > 40% of the onal features which to stability.	AND/OR V-shape vegetative protection 40% of the band	d channels have on is present on > ks and stable	Erosion/raw ban AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	g channel. Greater bed is covered by uting to instability. channels and/or	CI
Score	3		2	4	:	2	1.	6	1		1.6
NOTES>>		Deeply inc	ised in 50' r	nearest railr	oad grade	-100ft west	of railroad. F	ield Sheet	02-STR-01.		
	N BUFFERS: A	ssess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep	table)	Forested	
RIPARIAN	Option  Tree stratum (dbh > with > 60% tree canon-maintained und located within the	mal  3 inches) present, nopy cover and a lerstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy covered a	e entire SAR. (roo	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained		h may be accep	NOTES>> buffer excel portion of a and parking	ot for small sphalt road	
RIPARIAN Riparian Buffers	Option  Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a lerstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious sourfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	NOTES>> buffer excel portion of a and parking	ot for small sphalt road	
RIPARIAN Riparian Buffers	Option  Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a leerstory. Wetlands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorium l  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or or other comparable conditions.	NOTES>> buffer excel portion of a and parking	ot for small sphalt road	
Riparian Buffers  Condition Scores  Delineate ripascriptors. Determine scolow.	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a lerstory. Wetlands eriparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition Co g or estimating le parian category in	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums parian qual 100	NOTES>> buffer excel portion of a and parking	ot for small sphalt road	
Riparian Buffers  Condition Scores  Delineate ripascriptors. Determine scolow.	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a lerestory. Wetlands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> buffer excep portion of a and parking	ot for small sphalt road I lot	
RIPARIAN Riparian Buffers  Condition Scores Delineate ripascriptors. Determine solow. Enter the % F	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.5	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5	NOTES>> buffer excep portion of a and parking	ot for small sphalt road lot	CI
RIPARIAN Riparian Buffers  Condition Scores  Delineate ripa scriptors. Determine sclow. Enter the % F	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a lerstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition Co g or estimating le parian category in 10%	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums parian qual 100	NOTES>> buffer excep portion of a and parking	ot for small sphalt road I lot	CI 1.40
RIPARIAN  Riparian Buffers  Condition Scores  Delineate rips Scriptors. Determine solow. Enter the % F	Tree stratum (dbh > with > 60% tree ca a non-maintained und located within the located wi	3 inches) present, nopy cover and a terstory. Wetlands riparian areas.  5 each stream ban ach by measurin 90% 1.5 90% 1.5	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 10% 0.5	an areas along the ditional Categories and County of the blocks below the blocks below the ditional Categories and County of the categories and County of the categories and County of the blocks below the blocks below the ditional Categories and County of the blocks below the ditional Categories and County of the blocks below the ditional Categories and County of the blocks below the ditional Categories and County of the blocks below the ditional Categories and County of the blocks below the ditional Categories and County of the blocks below the ditional Categories and County of the blocks below the ditional Categories and County of the blocks below the difference of the blocks below the bloc	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the second of the second	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies the seeded and stabilized and	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums imparian qual 100 100%	table)  NOTES>> buffer exceportion of a and parking  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2 1.40 1.40 Large	
RIPARIAN Riparian Buffers  Condition Scores  Delineate ripa scriptors. Determine sclow. Enter the % fi Right Bank  Left Bank  INSTREAN dercut banks;	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	mal  3 inches) present, nopy cover and a leastory. Wetlands riparian areas.  5  5  5  6  6  7  8  8  8  8  8  8  8  8  8  8  8  8	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.5  10% 0.5  zes, water velocit exes, stable features.	an areas along the ditional Categoretimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (congth and width. (cong	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure the of % R Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	table)  NOTES>> buffer exceportion of a and parking  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	cores*0.01)/2 1.40 1.40 Large	
Riparian Buffers  Condition Scores  Delineate rips scriptors. Determine scolow. Enter the % f Right Bank  Left Bank	Tree stratum (dbh > with > 60% tree ca anon-maintained und located within the located wit	3 inches) present, nopy cover and a erestory. Wetlands riparian areas.  5 each stream ban ach by measurin 90% 1.5 90% 1.5 uried substrate si ffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category it 10% 0.5  10% 0.5  zes, water velocit exes, stable featu  Subo  Stable habitat ele	an areas along the ditional Categories and Congth and width. Categories and Congth and C	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & widt  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  Blocks ed  High  Dies Blocks ed  Blocks ed  Blocks ed  High  Dies Blocks ed  Bloc	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > impact of sa	cores*0.01)/2 1.40 1.40 Large	
Riparian Buffers  Condition Scores  Delineate ripa Secriptors. Determine scolow. Enter the % F Right Bank  Left Bank  INSTREAL Instream Habitat/	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	mal  3 inches) present, nopy cover and a leastory. Wetlands riparian areas.  5  5  5  6  6  7  8  8  8  8  8  8  8  9  8  1.5  9  9  1.5  1.5  1.5  1.5  1.5  1.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 10% 0.5  10% 0.5  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> buffer excep portion of a and parking  Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl> NOTES>> impact of sa fines, from o	cores*0.01)/2 1.40 1.40 Large	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Date Data Point SAR length Impact Factor Project # R2SB 02070010 11/2/2015 02-STR-08 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> Conditional Category Moderate embankments, spoil piles, constrictions, livestock Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach is disrupted by any of the channel alterations listed in stream reach is the parameter guidelines. If stream has been disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. srupted by any o the channel Iterations listed in Alteration guidelines. If stream has been shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. SCORE 1.5 0.5 1.3 1.1 0.9 0.7 1.30

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0 CR = RCI X LF X IF

INSERT PHOTOS:





Top Left: View of Culvert 02 above dropbox

Top Right: View of Culvert 09 **Bottom Left: View of Culvert 10** 

NC DWO Stream Identification Form Version 4.11

02-STR-08

Date: November 2, 2015	Project/Site: DC2RVA - Area 02	Latitude: 38.801270
Evaluator: L. Eggering, W. Moorhead	County: Fairfax	Longitude: -77.118006
<b>Total Points:</b> 45 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent (Perennial)	Other e.g. Quad Name:
A Goomorphology (Subtotal - 27.5	Absent Weak	Moderate Strong

A. Geomorphology (Subtotal = $27.5$ )	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	2	(3)
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	1	2	(3)
7. Recent alluvial deposits	0	1	2	(3)
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	(.5)
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	N	o = 0	Yes	€3)
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 8.5)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0)	1	2	3
14. Leaf litter	1.5	1	(0.5)	0
45. Onding out on plants and about	0	6.3	4	4.5

) · · · · · · · · · · · · · · · · · · ·				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	0	<b>(</b> 0. <b>5</b> )	1	1.5
16. Organic debris lines or piles	0	0.5	1	(1.5)
17. Soil-based evidence of high water table?	N	o = 0	Yes	(3)

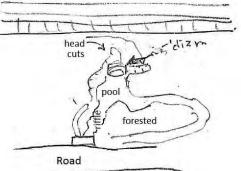
C. Biology (Subtotal = 9

18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	(1)	1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other <b>=</b> (	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Photos 487-491. Field Sheet 02-STR-01

Sketch:



Score > Lt Bank CI > 0.00 0.00  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >> 0.00  RCI= (Riparian CI)/2		Ephe	mera		fied Stream N	lethodology f	or use in Virg	Form	(For	n 1a)		
Name(e) of Evaluator(e) L Eggering, W. Moorhead  2. RIPARIAN BUFFERS: Assess both banks: 100 feet agents areas along the series SAR. (may) measurements of length & with may be acceptable)  Conditional Category  Optimal  Riparian  Riparian  Riparian  Riparian  Buffers  OCCONDITION INDEX and STREAM COUNTION UNITS FOR THIS REACH  Conditional Category  Assessment of length & with may be acceptable)  NOTES> NOTES> NOTES> NOTES> NO access to stream, Notes and Stream Annual Category  Optimal  Riparian  Ripar	Project #		Project Name	<b>.</b>		Cowardin		Date	SAR#			
Name(s) of Evaluator(s)  L. Eggering, W. Moorhead  Conditional Category  Optimal Suboptimal Confidence of Part of the Suboptimal Part of the Suboptimal Category  Optimal Suboptimal Category  Optimal Suboptimal Category  Optimal Suboptimal Category  I'me Stateman Name and Information  Leve Suboptimal Category  Optimal Suboptimal Category  I'me Stateman Name and Information  I'me Stateman Name Information	•				-					length		
E. RIPARIAN BUFFERS: Assess both bank's 100 local rigarian areas along the entire SAR. (rough resonancements of length & width may be acceptable)  Conditional Suboptimal Piget areas and Suboptimal Piget areas a						-	02070010	11/03/20				
Conditional Category  Conditional Category  Conditional Category  Conditional Category  Conditional Category  Conditional Category  Marginal  High Subopolinal  High Subopolin				Otream Nam	c and imornic	ation	02-57	TR-N9				
Optimal Subsportinal Fig. Subs		g,					02 0	1100				
Optimal Suboptimal Warping and High Marginal Ingent of the Company	. RIPARIAN	N BUFFERS: /	Assess both bank	s's 100 foot riparia	in areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt	th may be accepta	able)		
Right Bank  % Right On Head Score for each regard rate and Score for each regard rate and seven from the blocks below.  **Right Bank  % Right On Head Score for each regard rate and Score for each regard rate and seven from the blocks below.  **Right Bank  % Right On Head Score for each regard rate and Score for each regard rate and seven from the blocks below.  **Right Bank  % Right On Head Score for each regard rate and Score for each regard rate and seven from the blocks below.  **Right Bank  % Right On Head Score for each regard rate and score for e						gory						
Riparian Buffers    Tree detailum (dish > 3 inches) present   Wish   Storic Processor   S		Opt	imal	Subo	ptimal	Mar			oor			
Condition Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the escriptors.  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the escriptors.  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the escriptors.  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the escriptors.  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the escriptors.  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the escriptors.  Ensure the sums of % Riparian Area and Score for each ty measuring or estimating length and width. Calculators are provided for you along the sum of the Scores and Scor		with > 60% tree ca non-maintained un	nopy cover and an derstory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, recently seeded and stabilized, or other comparable	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	data is unav	анаріе.	
Scores 1.5 1.2 1.1 0.88 0.75 0.5 0.5 0.5  Delineate liparian areas along each stream bank into Condition Categories and Condition Scores using the Secretives.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you effect.  Right Bank Scores	Condition				Low	High	Low	High	Low			
Right Bank   Score		1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
Left Bank    Secretary   Secre	descriptors.  2. Determine squelow.  3. Enter the % F	uare footage for e	each by measurin	g or estimating le	ngth and width. (	Calculators are pr		of % F	Riparian equal 100			
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  WITE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCl) >> 0.0  RCl= (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >> 0  CR = RCl X LF X IF  NSERT PHOTOS:		% Pinarian Areas							0%			C
THE REACH CONDITION INDEX (RCI) >> 0.0  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >> 0  CR = RCI X LF X IF  NSERT PHOTOS:	Left Bank								0 /0			
THE REACH CONDITION INDEX (RCI) >> 0.0  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >> 0  CR = RCI X LF X IF  NSERT PHOTOS:												0.0
COMPENSATION REQUIREMENT (CR) >> 0  CR = RCI X LF X IF  NSERT PHOTOS:			REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH	<u> </u>		0.0
NSERT PHOTOS:  CR = RCI X LF X IF	IOTE: The Cls and R	RCI should be rounded					NDITION UN			ONDITION IND	EX (RCI) >>	
NSERT PHOTOS:	IOTE: The CIs and R	RCI should be rounded					NDITION UN		THE REACH C	CI= (Riparian CI)	/2	0.0
DESCRIBE PROPOSED IMPACT:							NDITION UN		THE REACH O RO COMPENSATION	CI= (Riparian CI) ON REQUIREM	/2	0.0
							NDITION UN		THE REACH O RO COMPENSATION	CI= (Riparian CI) ON REQUIREM	/2	0.0
	NSERT PHO	OTOS:	to 2 decimal places. T				NDITION UN		THE REACH O RO COMPENSATION	CI= (Riparian CI) ON REQUIREM	/2	0.0

Project/Site: DC2RVA-Segment 02 Latitude: 38.795939

NC DWQ Stream Identification Form Version 4.11

Date: November 3, 2015

02-STR-09

Evaluator: L. Eggering, W. Moorhead	County: Fairfax		Longitude: -77.149947		
<b>Total Points:</b> 0 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	1	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5		1.5	
11. Second or greater order channel	No	0 = 0	Yes	= 3	
artificial ditches are not rated; see discussions in manual		·			
B. Hydrology (Subtotal =)					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3	
C. Biology (Subtotal =)					
18. Fibrous roots in streambed	3	2	1	0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	1	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	)	
*perennial streams may also be identified using other meth-	ods. See p. 35 of manua	l.			
Notes: No access to stream. Stream was asses	sed based on aeria	l photography. No f	ield sheets. Doe	s not show up	
on National Hydrography Database.					
Sketch:					
oreton.					

				fied Stream N wadeable chan						
Project #		Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Segment 3		ent 3	Springfield, VA	R2SB3	02070010	11/02/15		J	
Nam	ne(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation					
L. Egg	gering, W. Mod	orhead				02-S	ΓR-10			
Channel (	Condition: Asse	ess the cross-sec	tion of the stream		ondition (erosion, conditional Catego					
	Optimal		Subo	ptimal		ginal	Po	or	Sev	ere
	1	W W	Slightly incircut f	ew areas of active		less than Severe or stable than Severe	Overwiden Vertically/laterally		1	5
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully	on or natural rock, 100%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproter of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to or newly develope portions of the r	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, td floodplains along reach. Transient	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran instability. Depositi stability, may be	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is inst. erosion. AND/OI stream is cover Sediment is temp nature, and contril AND/OR V-shapi	ority of both banks crosion present on ks. Vegetative nt on 20-40% of ffficient to prevent R 60-80% of the ad by sediment. corary/transient in puting to instability. ad channels have		stability. Severe trained within the ed below average ajority of banks ut. Vegetative on less than 20% of venting erosion. oughing present. ks on 80-100%.
	10% of			rs 10-40% of the bottom.	vegetative protecti banks and deposit	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.		than 80% of stream bed is covered by deposition, contributing to instability.  Multiple thread channels and/or subterranean flow.	
Score	3	3	2	2.4		2	1.	6	1	
. RIPARIA	N BUFFERS: A	Assess both bank			e entire SAR. (ro	-A-STR-01 ugh measuremen	ts of length & wid	th may be accep		· · · · · · · · · · · · · · · · · · ·
. RIPARIAI	N BUFFERS: A		Con	an areas along the	e entire SAR. (ro		ts of length & wid		ntable)  NOTES>> 75 herbaceous r	
RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or of other comparable conditions.	NOTES>> 75 herbaceous r some shrubs right of way. railroad grad adjacent park	neadow with in railroad Approx. 25% e and
Riparian Buffers	Tree stratum (dbh : with > 60% tree cc non-maintained una located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/4">30% tree canopy cover.</a> High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> 75 herbaceous r some shrubs right of way. railroad grad adjacent park	neadow with in railroad Approx. 25% e and
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine so	Tree stratum (dbh with > 60% tree canon-maintained un located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each r	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in 25%	ditional Categorian Categorian Categories and Coungth and width. Categories and with the categories and categor	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present or a stree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hap production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> 75 herbaceous r some shrubs right of way. railroad grad adjacent park	neadow with in railroad Approx. 25% e and
Riparian Buffers  Condition Scores Delineate ripescriptors. Determine stelow. Enter the %	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  .5  each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in	ditional Categorian Categorian Categories and Coungth and width. Categories and with the categories and categor	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present or a stree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hap production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded dust, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100	NOTES>> 75 herbaceous r some shrubs right of way. railroad grad adjacent park	neadow with in railroad Approx. 25% e and king lots.
Riparian Buffers  Condition Scores Delineate ripescriptors. Determine stelow. Enter the %	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each r  75%  0.75	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.5	ditional Categorian Categorian Categories and Coungth and width. Categories and with the categories and categor	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present or a stree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hap production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded dust, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100	NOTES>> 75 herbaceous r some shrubs right of way. railroad grad adjacent park  CI= (Sum % RA*S Rt Bank CI>	neadow with in railroad Approx. 25% e and king lots.
Riparian Buffers  Condition Scores  Delineate rip secriptors. Determine seelow. Enter the % Right Bank  Left Bank  INSTREAI	Tree stratum (dbh : with > 60% tree cc on non-maintained und located within the located w	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each r  75%  0.75  75%  0.75  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.5  25% 0.5  Zes, water velocii	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are prov.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>> 75 herbaceous r some shrubs right of way. railroad grad adjacent park	neadow with in railroad Approx. 25% e and king lots.  cores*0.01)/2 0.69 0.69 eam bed in ood-looking
Condition Scores  Delineate rip escriptors. Determine so elemter the %  Right Bank  Left Bank  INSTREA	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each r  75%  0.75  75%  0.75  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.5  25% 0.5  zes, water velocit exes, stable featu	ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (count the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substrational and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded dust, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100  100%	NOTES>> 75 herbaceous r some shrubs right of way. railroad grad adjacent park  CI= (Sum % RA*S Rt Bank CI> Lt Bank CI> Suprisingly g shape. Bould cobble of arti	neadow with in railroad Approx. 25% e and king lots.  ores*0.01)/2  0.69  oead-looking er and ficial origin
Condition Scores Delineate ripescriptors. Determine stelow. Enter the % Right Bank Left Bank Left Bank INSTREAIndercut banks Instream Habitat/ Available	Tree stratum (dbh with > 60% tree conon-maintained und located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5  each stream ban each by measurin  Score for each r  75%  0.75  75%  0.75  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.5  25% 0.5  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Count the blocks below th	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Indition Scores us Calculators are provided to the control of t	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum (dbh >3 inches) present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically % of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % Resident and seeding and stabilized and stabi	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed conditions.  Low 0.5  Low 0.5  Low 0.5  100%  100%	NOTES>> 75 herbaceous r some shrubs right of way. railroad grad adjacent park  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > Suprisingly g shape. Bould	neadow with in railroad Approx. 25% e and king lots.  ores*0.01)/2  0.69  oead-looking er and ficial origin
Condition Scores Delineate rip escriptors. Enter the % Right Bank Left Bank Linstream Habitat/	Tree stratum (dbh : with > 60% tree cc conon-maintained und located within the located wi	imal  3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5  each stream ban each by measurin  Score for each r  75%  0.75  75%  0.75  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.5  25% 0.5  zes, water velocitiexes, stable features suboptimes sub	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ingth and width. (in the blocks below  ty and depths; wo res.  Conditiona ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh 5) inches) present, with <30% tree canopy cover.  High  0.85  Indicate of the canopy cover.  Aligh  Stable habitat ele present in 10-30% are adequate for a stable habitat ele present in 10-30% are adequate for are adequate for a stable habitat ele present in 10-30% are adequate for a second and are adequate for a second are a second are adequate for a s	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> 75 herbaceous r some shrubs right of way. railroad grad adjacent park  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>> Str suprisingly g shape. Bould cobble of artic	neadow with in railroad Approx. 25% e and king lots.  cores*0.01)/2 0.69 0.69 read bed in ood-looking er and ficial origin

	St	ream Im	pact A	ssessm	ent For	m Page	2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB3	02070010	11/02/2015	02-STR-10		
	L ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, conc	rete, gabions, or o		straightening of ch	hannel, channeliz	ation,	NOTES>> To cut banks; ri banks vegeta	p-rapped
	Negligible	Mir	nor	Mode	erate	Sev	ere	_	•
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with gal cem	of the channel in the parameter oR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5		
	REACH C	ONDITION IN	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH		

#### INSERT PHOTOS:





Top Left: View downstream toward culvert under railroad
Top Right: View downstream along railroad
Bottom Left: View upstream away from railroad

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 11/02/2015

Sketch:

02-STR-10

Latitude: 38.773026

otal Points: 33				Longitude: -77.158048		
Stream is at least intermittent ≥ 19 or perennial if ≥ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:			
A. Geomorphology (Subtotal = 16)	Absent	Weak	Moderate	Strong		
a. Continuity of channel bed and bank	0	1	2	(3)		
. Sinuosity of channel along thalweg	0	1	(2)	3		
. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3		
. Particle size of stream substrate	0	1	2	(3)		
. Active/relict floodplain	(0)	1	2	3		
. Depositional bars or benches	0	1	(2)	3		
. Recent alluvial deposits	0	1	(2)	3		
. Headcuts	(0)	1	2	3		
. Grade control	0	0.5	1	(1.5)		
0. Natural valley	0	(.5)	1	1.5		
Second or greater order channel     artificial ditches are not rated; see discussions in manual	No	)=(0)	Yes	= 3		
artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = $5.5$ )						
2. Presence of Baseflow	0	1	2	3		
3. Iron oxidizing bacteria	0)	1	2	3		
4. Leaf litter	1.5	1	0.5	0		
5. Sediment on plants or debris	0	0.5	(1)	1.5		
6. Organic debris lines or piles	0	0.5	(1)	1.5		
7. Soil-based evidence of high water table?	No	=(0)	Yes = 3			
C. Biology (Subtotal = 11.5)	_					
8. Fibrous roots in streambed	(3)	2	1	0		
9. Rooted upland plants in streambed	(3)	2	1	0		
Macrobenthos (note diversity and abundance)	0	1	2)	3		
Aquatic Mollusks	0	1	2	3		
2. Fish	0	0.5	1	1.5		
3. Crayfish	0	0.5	1	1.5		
4. Amphibians	0	0.5	1	1.5		
5. Algae	0	0.5	1	1.5		
6. Wetland plants in streambed	<u>'</u>	FACW = 0.75; OB	L = 1.5) Other = 0	)		
perennial streams may also be identified using other meth	nods. See p. 35 of manua	ıl.				

		Stre		SSESS fied Stream N			) (For	m 1)			
				wadeable chan							
Project # Project N		Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Segm		ent 3	Springfield, VA	R4SB	02070010	11/02/15				
Nam	ame(s) of Evaluator(s)		Stream Name and Inform								
L. Egg	jering, W. Mod	orhead				02-S	ΓR-11				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Suboptimal		Conditional Category  Marginal		Poor		Severe		
	1	The state of the s		The same of the sa		Often incised, but less than Severe or		Overwidened/incised.		5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars, are present. Acce floodplain or fully bankfull benches. and transverse ba	or active erosion; 80 inks. Vegetative in or natural rock, 100%). AND/OR /bankfull benches ass to their original y developed wide Mid-channel bars, ars few. Transient	of udinis are statute (00-00%).  Vegetative protection or natural rock prominent (60-80%) AND/OR  Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the proof. Transient		Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute		Vertically/laterally unstable. Likely to widen further. Majority of both banks fare near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in onature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable		s Leeply invascu (vi excusaved); service and instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present.		
		on covers less than bottom.									С
Score	3	3	2	4		2	1.	6	1		2.0
NOTES>> 2. RIPARIAI	N BUFFERS: /	Assess both bank	1. 100 ()	•	ioia Giiooti	03-A-STR-02	_1				
			•		,	ugh measuremen	ts of length & wid				
	Onti		Con	ditional Cate	gory				NOTES>> O		
Riparian Buffers	Tree stratum (dbh: with > 60% tree canon-maintained un	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree		gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation,	ts of length & wid  Pc  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots trails or		de = most left, most se ed and shrub, ler part at margin	
Buffers	Tree stratum (dbh: with > 60% tree canon-maintained un	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or ofther comparable	NOTES>> Or railroad grad of area. On of area dens unmaintained herbaceous and in small parking lot a	de = most left, most se ed and shrub, ler part at margin	
	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Categorium Low Suboptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed loots, trails, or other comparable conditions.	NOTES>> Or railroad grad of area. On of area dens unmaintained herbaceous and in small parking lot a	de = most left, most se ed and shrub, ler part at margin	
Condition Scores  Delineate ripiescriptors. Delevenine scorelow.	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1.  arian areas along uare footage for e	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Or railroad grad of area. On of area dens unmaintained herbaceous and in small parking lot a	de = most left, most se ed and shrub, ler part at margin	
Condition Scores  Delineate ripiescriptors. Delevenine scorelow.	Tree stratum (dbh : with > 60% tree or non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Or railroad grad of area. On of area dens unmaintained herbaceous and in small parking lot a	de = most left, most se ed and shrub, ler part at margin	
Condition Scores  1. Delineate ripidescriptors. 2. Determine schelow. 3. Enter the % I	Tree stratum (dbh: with > 60% tree cz non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each r 80% 0.5	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.75	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>> Or railroad grad of area. On of area dens unmaintaine herbaceous and in small parking lot a of 100 foot r	de = most left, most se ed and shrub, ler part at margin radius.	
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Condition Scores  Delineate rip descriptors. Enter the % I Right Bank  Left Bank  Left Bank  Left Bank  Left Bank	Tree stratum (dbh: with > 60% tree cz non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each r  80%  0.5  90%  0.75  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.75	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. (	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Academic Scores us Calculators are prov.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Or railroad grad of area. On of area dens unmaintaine herbaceous and in small parking lot a of 100 foot received by the second	de = most left, most se ed and shrub, ler part at margin radius.  cores*0.01)/2 0.55 0.73 early 100% habitat is	
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#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor R4SB 02070010 11/02/2015 02-STR-11 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> Most of embankments, spoil piles, constrictions, livestock Conditional Category Moderate stream is bordered by railroad ballast slope. Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. 0.5 0.70 SCORE 1.5 1.3 1.1 0.9 0.7 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole num

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Typical view of stream along railroad Top Right: Typical view of stream along railroad Bottom Right: Typical view of stream along railroad



Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 11/02/2015

02-STR-11

Latitude: 38.772257

Total Points: 27.25	County: Fairfax		Longitude: -77	.158637	
Stream is at least intermittent f ≥ 19 or perennial if ≥ 30*		nation (circle one) mittent Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal = 10)	Absent	Weak	Moderate	Strong	
a. Continuity of channel bed and bank	0	1	2	(3)	
2. Sinuosity of channel along thalweg	0	(1)	2	3	
B. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
Particle size of stream substrate	0	(1)	2	3	
5. Active/relict floodplain	(0)	1	2	3	
6. Depositional bars or benches	(0)	1	2	3	
7. Recent alluvial deposits	0	1	2)	3	
B. Headcuts	0	1	(2)	3	
9. Grade control	0	0.5	(1)	1.5	
0. Natural valley	(0)	0.5	1	1.5	
1. Second or greater order channel	No	=(0)	Yes =	= 3	
artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = 11 )					
2. Presence of Baseflow	0	1	(2)	3	
3. Iron oxidizing bacteria	0	1	(2)	3	
4. Leaf litter	1.5	(1)	0.5	0	
5. Sediment on plants or debris	0	0.5	1	(1.5)	
6. Organic debris lines or piles	0	0.5	1	(1.5)	
7. Soil-based evidence of high water table?	No	= 0	Yes =	$\overline{}$	
C. Biology (Subtotal = 6.25)		· · · · · · · · · · · · · · · · · · ·			
8. Fibrous roots in streambed	3	(2)	1	0	
9. Rooted upland plants in streambed	(3)	2	1	0	
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	( <u>0</u> )	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
	0	(1.5)	1	1.5	
24. Amphibians					
	(0)	0.5	1	1.5	
24. Amphibians 25. Algae	0	0.5			
24. Amphibians		0.5 FACW = <b>(</b> 0.7 <b>5</b> ); OBI			

		Stre	Unit	fied Stream N	/lethodology f	or use in Virg		m 1)			
Project #		Project Name		wadeable chan	nels classified a Cowardin	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact	
		•		•	Class.			SAR#	length	Factor	
	N/A DC2RVA - Segm			VA and Informa	R4SB	02070010	10/30/15				
Name(s) of Evaluator(s)  J. Budnik, M. Rockwell		Stream Nam	e and imornic	02-STR-12a (Long Branch)							
	Condition: Asse		tion of the stream	and prevailing co			(Long Bi	ariori)			
				C	Conditional Catego	ry	Po	or	Sov	voro.	
	Very little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.		7% stable banks. Vegetative ace protection or natural rock, minent (80-100%). AND/OR le point bars/bankfull benches resent. Access to their original dplain or fully developed wide ull benches. Mid-channel bars, transverse bars few. Transient ent deposition covers less than 10% of bottom.		Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or underout. AND/OR 40- 60% of stream is covered by sediment. Sediment may be temporary/transient, contribute instability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have		widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in		beeply incised (of accorated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present.  Erosion/raw banks on 80-100%.  AND/OR Aggrading channel. Greater than 80% of stream bed is covered by		
Channel Condition											CI
		stream bottom.			vegetative protection on > 40% of the banks and depositional features which contribute to stability.				deposition, contributing to instability. Multiple thread channels and/or subterranean flow.		Ci
Score	3		2	.4		2	1.	6	1		2.0
NOTES>>									C-STR-16, To	eam C.	
	Banks N BUFFERS: A	ssess both bank	s's 100 foot riparia		e entire SAR. (ro	ugh measuremen ginal		h may be accep	NOTES>> B	anks have Right bank,	
	N BUFFERS: A	mal  3 inches) present, noches over and a nerstory. Wellands	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	con areas along the ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	e entire SAR. (ro  gory  Mar  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, active feed conditions.	table)	anks have Right bank, o has last within	
2. RIPARIAI	Optio  Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a erstory. Wetlands riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	can areas along the ditional Categorium Cate	e entire SAR. (rogory  Mar  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> B vegetation. in addition t vegetation, railroad ball	anks have Right bank, o has last within	
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Condition Scores  Delineate rip descriptors. Enter the % Right Bank  Left Bank	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the distribution of the care	mal  3 inches) present, nopy cover and a erestory. Wetlands riparian areas.  5  beach stream ban ach by measurin 100% 0.75 100% 0.6	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in	an areas along the ditional Categories and Council Categories and Categories and Council Categories and Categories an	e entire SAR. (ro gory  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stablized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ex	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums sparian qual 100 100%	NOTES>> B vegetation. in addition t vegetation, railroad ball riparian buff  Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl >	anks have Right bank, to has ast within fer.	CI 0.668
Riparian Buffers  Condition Scores  Delineate rip Jescriptors. Deleness elow. Right Bank  Left Bank  INSTREAL	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	3 inches) present, nopy cover and a erestory. Wetlands riparian areas.  5 each stream ban ach by measurin 100% 0.75 100% 0.6	Con Subop High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. Con the blocks below	e entire SAR. (ro gory  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stablized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ex	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums sparian qual 100 100%	NOTES>> B vegetation. in addition t vegetation, railroad ball riparian buff	anks have Right bank, to has ast within fer.	
Condition Scores  1. Delineate rip Jescriptors. 2. Determine scoelow. 3. Enter the % Right Bank Left Bank 3. INSTREAL	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.  5 5 ach stream ban ach by measurin 100% 0.75 100% 0.6 uried substrate siffle poole complete the poole complete the stream ban ach by measurin 100% 0.75	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  parian category in  zes, water velocit exes, stable features	to a reas along the ditional Categorithmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Coungth and width. Coungth and width. Coungth and width. Coungth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (bth > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> B vegetation. in addition t vegetation, railroad ball riparian buff  Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl >	anks have Right bank, to has ast within fer.	
Condition Scores  Delineate rip Edescriptors  Delineate rip Edescriptors  Delineate rip Edescriptors  Edescriptors  Right Bank  Left Bank  Instream Habitat/	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	3 inches) present, nopy cover and a terstory. Wetlands riparian areas.  5 each stream ban ach by measurin 100% 0.75 100% 0.6 uried substrate siffle poole comple	Con Subo Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo Stable habitat elei	to a reas along the ditional Categories and Council Categories and Categories and Council Categories and Categories and Council Categories and Cate	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ee Blocks	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, conditions.  Low 0.5  Low 0.5  Low 100%  100%	NOTES>> B vegetation. in addition t vegetation, railroad ball riparian buff  Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl >	anks have Right bank, to has ast within fer.	
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % Right Bank Left Bank 3. INSTREAL undercut banks;	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.  5 sach stream ban ach by measurin 100% 0.75 100% 0.6 uried substrate si ffle poole comple the typically present et typically et typically present et typically et typically present et typically	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and depths; wo res.  Conditionaptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr w.  Stable habitat ele present in 1-30% are adequate for	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (6th > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%	NOTES>> B vegetation. in addition t vegetation, railroad ball riparian buff  Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl >	anks have Right bank, to has ast within fer.	

	St	ream In	npact A	ssessm	ent Fo	rm Pag	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB	02070010	10/30/15	02-STR-12a		
	ALTERATION: Stream cross poil piles, constrictions, livestock Negligible			al Category	straightening of cl		zation,	NOTES>> Solution NOTES N	railroad
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	30% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or	with office p	oark.

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:





Top Left: View of beginning of stream with wetland vegetation Top Right: Typical view of stream along railroad

Bottom Left: Typical view of stream along railroad

NC DWQ Stream Identification Form Version 4.11 Long Branch 02-STR-12a

Date: 10/30/2015 Project/Site: DC2RVA - Area 02 Latitude: 38.770146

Evaluator: J. Budnik, M. Rockwell County: Fairfax Longitude: -77.160578

Total Points: 30.5
Stream Determination (circle one)
Stream is at least intermittent

Stream Determination (circle one)
Stream Determination (circle one)

Stream is at least intermittent if  $\geq 19$  or perennial if  $\geq 30^*$  Ephemeral Intermittent (Perennial) e.g. Quad Name:

Absent	Weak	Moderate	Strong
0	1	(2)	3
0	(1)	2	3
0	1	2	3
0	1)	2	3
(0)	1	2	3
0	(1)	2	3
0	(1)	2	3
(0)	1	2	3
0	(1.5)	1	1.5
(0)	0.5	1	1.5
No	0 = 0	Yes:	€3)
0	1	2	3
0	1	(2)	3
1.5	(1)	0.5	0
0	(0.5)	1	1.5
0	0.5	(1)	1.5
No	0 = 0	Yes:	<del>(</del> 3)
1		-	
3	(2)	1	0
(3)	2	1	0
0	(1)	2	3
0	(1)	2	3
0	(0.5)	1	1.5
0	(0.5)	1	1.5
0	0.5	(1)	1.5
0	0.5	(1)	1.5
	FACW = 0.75;	OBL =(1.5) Other = 0	)
See p. 35 of manua	ıl.		
		t. 02 C CTD 4C	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 0 5 1 0 0 5 1 No = 0 Yes:  3 2 1 0 0 5 1 No = 0 Yes:  3 2 1 0 0 1 2 0 0 1 2 0 0 5 1 No = 0 Yes:

		Stre	Unit	SSESS fied Stream N	lethodology f	or use in Virg	ginia	m 1)			
Project #		Project Name		Locality	nels classified a Cowardin	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact	
-	r	-roject Name	;	Locality	Class.		Date	SAR#	length	Factor	
N/A		RVA - Segme		VA	R4SB	02070010	10/30/15		100		
	e(s) of Evaluat	. ,	Stream Nam	e and Informa		TD 401					
J. Bu	ıdnik, M. Roc	kwell			02-8	TR-12b	(Long Br	anch)			
. Channel C	Condition: Asses	ss the cross-sec	tion of the stream		ondition (erosion,						
	Optii	mal	Subo	ptimal		ginal	Po	or	Sev	ere	
	Very little incision or	active erosion; 80	erosion or unproted	ew areas of active cted banks. Majority	Poor. Banks more	less than Severe or stable than Severe ower bank slopes.	Overwiden Vertically/laterally widen further. Maj	unstable. Likely to	Deeply incised vertical/lateral in incision, flow con	stability. Severe	
Channel Condition	100% stable ban surface protection prominent (80-10 Stable point bars/k are present. Acces floodplain or fully bankfull benches. I and transverse ban sediment deposition 10% of b	n or natural rock, 00%). AND/OR oankfull benches ss to their original developed wide Mid-channel bars, rs few. Transient n covers less than pottom.	Vegetative protect prominent (6)- Depositional feat stability. The bar channels are well likely has access to or newly develope portions of the r sediment cover stream	table (60-80%). tion or natural rock -80%) AND/OR tures contribute to Mtull and low flow II defined. Stream o bankfull and benches, difloodplains along reach. Transient is 10-40% of the bottom.	both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se- temporary/tran instability. Depositi stability, may be AND/OR V-shap vegetative protecti banks and deposit contribute	esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- in is covered by diment may be sient, contribute on that contribute to forming/present. ed channels have on on > 40% of the ional features which to stability.	·	ks. Vegetative nt on 20-40% of ffficient to 20-40% of ffficient to prevent R 60-80% of the ad by sediment. or orary/transient in buting to instability, and channels have on is present on > nks and stable sition is absent.	banks. Streambe rooting depth, rr vertical/underc protection present to banks, is not preo Obvious bank sl. Erosion/raw ban AND/OR Aggradin, than 80% of stream deposition, contrib Multiple thread subterran	ad below average lajority of banks ut. Vegetative on less than 20% of venting erosion. Judphing present. ks on 80-100%. g channel. Greater is bed is covered by uting to instability. channels and/or ean flow.	CI
Score	3		2	4		2	1.	6	1	l	1.6
						ugn measuremen	ts of length & wid	th may be accep	table)		
Riparian Buffers	Option  Tree stratum (dbh > with > 60% tree can non-maintained und located within the	3 inches) present, nopy cover and a lerstory. Wetlands	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- mogration area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or of other comparable conditions.	NOTES>> L forested up buildings, approximate from stream bank is railr fill/ballast.	to office ely 75 feet n. Right	
•	Tree stratum (dbh > with > 60% tree can non-maintained und located within the	3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> L forested up buildings, approximate from stream bank is railr fill/ballast.	to office ely 75 feet n. Right	
Buffers	Tree stratum (dbh > with > 60% tree car	3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- mogration area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or of other comparable conditions.	NOTES>> L forested up buildings, approximate from stream bank is railr fill/ballast.	to office ely 75 feet n. Right	
Condition Scores  1. Delineate ripz descriptors. 2. Determine scorelow.	Tree stratum (dbh > with > 60% tree can non-maintained und located within the located wit	3 inches) present, nopy cover and a lerstory. Weltands a riparian areas.	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> L forested up buildings, approximate from stream bank is railr fill/ballast.	to office ely 75 feet n. Right	
Condition Scores  Delineate rip lescriptors. Determine so	Tree stratum (dbh > with > 60% tree car non-maintained und located within the	3 inches) present, nopy cover and a leastory. Wetlands riparian areas.	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> L forested up buildings, approximate from stream bank is railr fill/ballast.	to office ely 75 feet i. Right oad	
Condition Scores  Delineate rips lescriptors. Determine so- lelow. Enter the % I	Tree stratum (dbh > with > 60% tree can non-maintained und located within the located wit	3 inches) present, nopy cover and a lerstory. Wetlands in partial areas.	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums iparian qual 100 100%	NOTES>> L forested up buildings, approximate from stream bank is railr fill/ballast.	to office ely 75 feet i. Right oad	CI
Condition Scores  Delineate ripe escriptors. Determine soelow. Enter the % F	Tree stratum (dbh > with > 60% tree can non-maintained und located within the located wit	3 inches) present, nopy cover and a lerstory. Weltands a riparian areas.	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> L forested up buildings, approximate from stream bank is railr fill/ballast.	to office ely 75 feet i. Right oad	CI 0.80
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Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	Tree stratum (dbh > with > 60% tree can non-maintained und located within the located wit	3 inches) present, nopy cover and a erestory. Wetlands riparian areas.  5  5  5  6  6  6  7  8  8  8  8  8  8  8  8  8  8  8  8	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you  pris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> L forested up buildings, approximate from stream bank is railr fill/ballast.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	to office ely 75 feet a. Right oad  cores*0.01)/2 0.50	
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#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Impact Factor Project # Date N/A R4SB 02070010 10/30/15 02-STR-12b 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> Along embankments, spoil piles, constrictions, livestock Conditional Category Moderate railroad fill. Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is the parameter guidelines. If stream has been disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed i srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. 1.5 0.5 0.50 SCORE 1.3 1.1 0.9 0.7 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >>

COMPENSATION REQUIREMENT (CR) >>> 0

CR = RCI X LF X IF

Top Left: Typical view of stream along railroad
Top Right: Typical view of stream along railroad
Bottom Left: Typical view of stream along railroad

		Stre	Unit	SSESS fied Stream N	lethodology f	or use in Virg	ginia	m 1)			
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2	RVA - Segme	ent 3	VA	R2SB3	02070010	10/30/15		length	ractor	
	e(s) of Evalua			e and Informa			1 1 1 1 1 1 1				
J. Bu	ıdnik, M. Roc	kwell			02-S	TR-13a	(Long Br	anch)			
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal c	onditional Catego Mar	ry ginal	Po	or	Sev	ere	
	The state of the s		13			less than Severe or	Overwiden		1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or full) bankfull benches. and transverse ba	or active erosion; 80- inks. Vegetative nor natural rock, (00%). AND/OR /bankfull benches ses to their original y developed wide Mid-channel bars, ars few. Transient on covers less than	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	ew areas of active toted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, di floodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositiv stability, may be	stable than Severe wer bank slopes. essent on 40-60% of tative protection on Streambanks may errut. AND/OR 40- in is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is inst. erosion. AND/OI stream is cover Sediment is temp nature, and contril AND/OR V-shapi	ority of both banks crosion present on ks. Vegetative nt on 20-40% of ffficient to prevent R 60-80% of the ab ysediment, orary/transient in puting to instability, ad channels have	Deeply incised vertical/lateral ininicision, flow con banks. Streambe rooting depth, m vertical/lunderc protection present o banks, is not pre Obvious bank slt Erosion/raw ban AND/OR Aggradin	stability. Severe tained within the de below average hajority of banks ut. Vegetative on less than 20% of eventing erosion. Doughing present. ks on 80-100%.	
	10% of			rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depor	ks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	uting to instability. channels and/or	C
Score	3	3	2	.4		2	1.	6	1		1.
. RIPARIAI	N BUFFERS: /	Assess both bank	's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	h may be accep	table)		
2. RIPARIAI	N BUFFERS: /	Assess both bank	Con	an areas along the ditional Cate ptimal	gory	ugh measuremen	ts of length & wid		notes>>		
2. RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con	ditional Cate	gory						
Riparian Buffers	Opti Tree stratum (dbh with > 60% tree conon-maintained un	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree cr non-maintained un located within th  1. arian areas along quare footage for e	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100			
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Riparian Buffers  Condition Scores  Delineate rip descriptors. Legion of the condition of t	Tree stratum (dbh: with > 60% tree cr non-maintained un located within th  1. arian areas along quare footage for e	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100		cores*0.01)/2	
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Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each ri  100%  0.85  100%  1.1  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si		C 0.9
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5  each stream ban each by measurin 100% 0.85  100% 1.1  aried substrate si iffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable feature	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t     of % R     Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 10.5  L	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.85	
Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree conon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  100%  0.85  100%  1.1  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo  Stable habitat elpresent in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically & of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % Reserved Blocks estable Blocks	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.85	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi; root mats; SAV; r  Opti Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  100%  0.85  100%  1.1  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below ty and depths; wo res.  Conditional ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.85	

	St	ream In	npact A	ssessm	ent For	rm Pag	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB3	02070010	10/30/15	02-STR-13a		
	ALTERATION: Stream cross poil piles, constrictions, livestock		Conditiona	al Category				NOTES>> D associated developmen	with
	Negligible	Mir	nor	Mod	erate	Sev	/ere	do voio pinio.	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0 shored with ga	90% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or tent.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



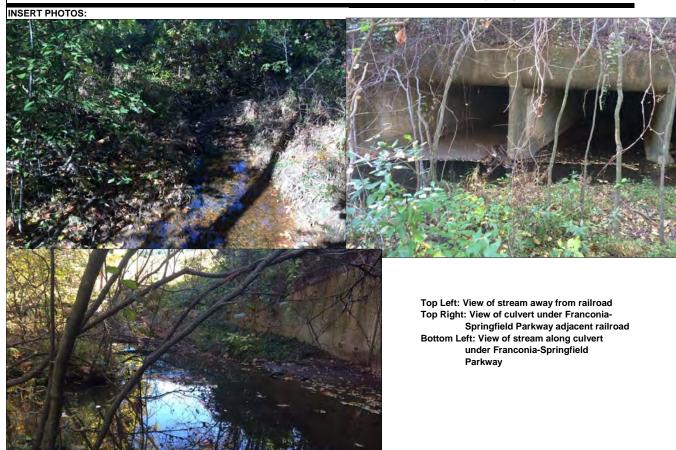
		Stre	Uni	fied Stream M	lethodology f	or use in Virg		· · · · · · · · · · · · · · · · · · ·			
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2	RVA - Segme	ent 3	VA	R2SB3	02070010	10/30/15		iongai	ractor	
Nam	e(s) of Evalua			e and Informa	ation	l.	L				
J. Bu	dnik, M. Roc	kwell			02-S	TR-13b	(Long Br	anch)			
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal	onditional Catego	<sub>ry</sub> ginal	Po	or	Sev	ere	
	-		The state of the s		Often incised, but	less than Severe or	Overwiden	ed/incised.	1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ess to their original of developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are stogetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to revelope the protection of the	ew areas of active ted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, di floodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe were bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the bed by sediment. orary/transient in outing to instability.	Deeply incised vertical/lateral ininicision, flow con banks. Streambe rooting depth, m vertical/lunderc protection present obanks, is not pre Obvious bank st. Erosion/raw ban AND/OR Aggrading	stability. Severe tained within the dd below average ajority of banks ut. Vegetative in less than 20% of venting erosion. bughing present. ks on 80-100%.	
	sediment deposition 10% of		sediment cover	rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depos	iks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	С
Score	3	3	2	.4		2	1.	6	1		2.0
NOTES>> 2. RIPARIAI	N BUFFERS: /		·	·				et: 03-C-ST			
	N BUFFERS: /	Assess both bank	s's 100 foot riparia	·	e entire SAR. (roo	ugh measuremen		h may be accep			
	Opti Tree stratum (dbh: with > 60% tree ca	Assess both bank imal  - 3 inches) present, norhesory over and a derstory. Wetlands	s's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & wid	h may be accep	table)		
2. RIPARIAI Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cr. non-maintained un	Assess both bank imal  - 3 inches) present, norhesory over and a derstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	table)		
2. RIPARIAI	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	Assess both bank imal  - 3 inches) present, norhesory over and a derstory. Wetlands	Con Subo  Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	table)		
Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 22. Determine scobelow.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of t	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dength area))	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	table)		
Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 22. Determine scobelow.	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin Score for each ri 100%	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dength area))	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	table)		
Riparian Buffers  Condition Scores  Delineate ripidescriptors. Delineate ripidescriptors. Enter the % I	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of t	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dength area))	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	table)	cores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate ripidescriptors. Delineate ripidescriptors. Enter the % I	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 0.85	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dength area))	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	table)  NOTES>>  Cl= (Sum % RA * Si  Rt Bank Cl >	0.85	Ci
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Score >	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5  each stream ban each by measurin 100% 0.85  100% 1.1  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below the dense way and the blocks below the blocks below the dense way and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are province.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & wide  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	table)  NOTES>>  Cl= (Sum % RA * Si		
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I	Tree stratum (dbh: with > 60% tree ca non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Score >  W HABITAT: Va root mats; SAV; r	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5.5  each stream ban each by measurin  100%  0.85  100%  1.1  aried substrate sifffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  parian category in  zes, water velocit exes, stable features	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & wide  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Post Ingerian Low	Cl= (Sum % RA * Si Rt Bank Cl >	0.85	
Condition Scores  1. Delineate ripidescriptors. 22. Determine scoelow. 3. Enter the % I Right Bank Left Bank 3. INSTREAI	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  W HABITAT: V: root mats; SAV; r	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5  each stream ban each by measurin 100% 0.85  100% 1.1  arried substrate si iffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (an the blocks below the blocks below the blocks below the ptimal ments are typically ments are typically ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided by the condition of the condition	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	ts of length & widd  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  Blocks en  High  Deliver to the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%	CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI >	0.85	
Condition Scores Delineate rip. Left Bank  INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  W HABITAT: V: root mats; SAV; r	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5.5  each stream ban each by measurin  100%  0.85  100%  1.1  aried substrate siffle poole completimal  re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50% are adequate for	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (6th > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  pris; stable substr	ts of length & wide  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI >	0.85	CI 0.9

	St	ream In	npact A	ssessm	ent Fo	rm Pag	e 2		
Project#	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB3	02070010	10/30/15	02-STR-13b		
	L ALTERATION: Stream cross spoil piles, constrictions, livestock  Negligible			al Category	straightening of cl		zation,	NOTES>> C located to s Developme	outh. nt on either
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than a disrupted by an alterations listed guidelines AND/s shored with ga	30% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or nent.	side of stre	am.
			1.1	0.9		1	.5	1	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF



NC DWQ Stream Identification Form Version 4.11 Long Branch 02-STR-13b

Date: 10/30/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.767784
Evaluator: J. Budnik, M. Rockwell	County: Fairfax	Longitude: -77.163800
<b>Total Points:</b> 39 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 16.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	(.5)	1	1.5
11. Second or greater order channel	No	= 0	Yes:	<b>€</b> 3)
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $9.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes:	(3)
C. Biology (Subtotal = 13			•	
18. Fibrous roots in streambed	3	(2)	1	Ō
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	1	(2)	3
22. Fish	0	0.5	1	(1.5)
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5	1	(1.5)
25. Algae	0	0.5	1	(1.5)
26. Wetland plants in streambed		FACW = 0.75;	OBL =(1.5) Other = 0	)
*perennial streams may also be identified using other metho	ds. See p. 35 of manua			
Notes: Minnows and tadpoles seen throughout. F	ield Sheet: 03-C S	TR-16 #4		
- will thows and taupoies seen throughout. F	ieiu oneet. W-6-3	++ <del>+-</del> +++++++++++++++++++++++++++++++++		

		Stre		fied Stream N	lethodology f	or use in Virg	jinia	m 1)			
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2	RVA - Segme	ent 3	VA	R2SB3	02070010	10/30/15		length	1 dotor	
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
J. Bu	ıdnik, M. Roc	kwell			02-S	TR-13c	(Long Br	anch)			
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal	Conditional Categor	ginal	Po	or	Sev	ere	
					Often incised, but I	less than Severe or	Overwiden	ed/incised.	5		
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ess to their original of developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	ew areas of active ted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR ures contribute to ktfull and low flow II defined. Stream o bankfull benches, of floodplains along each. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe wer bank slopes. seent on 40-60% of lative protection on Streambanks may rout. AND/OR 40-0-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the bed by sediment. orary/transient in outing to instability.	Deeply incised vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/lunderc protection present c banks, is not pre Obvious bank slt Erosion/raw ban AND/OR Aggrading	stability. Severe tained within the de below average hajority of banks ut. Vegetative on less than 20% of vventing erosion. Dughing present. ks on 80-100%.	
	sediment deposition 10% of		sediment cover	s 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protecti 40% of the bar sediment depos	iks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	С
Score	3	3	2	.4		2	1.	6	1	1	2.0
NOTES>> 2. RIPARIAI	N BUFFERS: /							h may be accep			
	N BUFFERS: /	Assess both bank	's 100 foot riparia		e entire SAR. (roo			h may be accep			
	Opti	Assess both bank imal  - 3 inches) present, nover and a derstory. Wetlands	's 100 foot riparia  Con  Subor  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.	ugh measuremen	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	table)		
2. RIPARIAI Riparian Buffers	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	Assess both bank imal  - 3 inches) present, anches over and a derstory. Wetlands e riparian areas.	's 100 foot riparia  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	In areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a href="mailto:30%">30%</a> tree canopy cover with maintained understory.  Low	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	notes>> Inculvert asso		
2. RIPARIAI	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	Assess both bank imal  - 3 inches) present, nover and a derstory. Wetlands	's 100 foot riparia  Con  Subor  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	notes>> Inculvert asso		
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scopelow.	Tree stratum (dbh: with > 60% tree cr non-maintained un located within th  1. arian areas along quare footage for e	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	's 100 foot riparia  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Cinto Condition Co	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/stree-canopy.cover.">https://doi.org/10.100/stree-canopy.cover.</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 1.5	notes>> Inculvert asso		
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scopelow.	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin Score for each ri 100%	's 100 foot riparia  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Cinto Condition Co	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/stree-canopy.cover.">https://doi.org/10.100/stree-canopy.cover.</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	notes>> Inculvert asso		
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Riparian Buffers  Condition Scores  Delineate rip descriptors. Deltermine scoelow. Enter the % l	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	Assess both bank imal  - 3 inches) present, enopy cover and a derstory. Wetlands e riparian areas.  5  - 5  - 8  - 8  - 100%  - 1.1  - 100%	's 100 foot riparia  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Cinto Condition Co	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.250/">https://doi.org/10.250/</a> High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 1.5	NOTES>> In culvert assorailroad.  Cl= (Sum % RA * Siret Bank Cl >	cores*0.01)/2	CI
Condition Scores  1. Delineate rip Jescriptors. 2. Determine scoelow. 3. Enter the % Right Bank Left Bank 3. INSTREAL	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	Assess both bank imal  3 inches) present, enopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.1  100% 1.1  aried substrate si	Con Subor Subor Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 Sinto Condition C g or estimating le parian category in	un areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Con the blocks below by and depths; wo	Be entire SAR. (rongory  Mary  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dh) > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prove	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with amaintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, roiter comparable conditions.  Low 0.5  Low 0.5  Low 0.5  Low 0.5	notes>> In culvert assorailroad.	ociated with	CI 1.1
Condition Scores  1. Delineate rip Jescriptors. 2. Determine scoelow. 3. Enter the % Right Bank Left Bank 3. INSTREAL	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  Each stream ban each by measurin 100% 1.1  100% 1.1  aried substrate si fifte poole comple	Con Subor Subor Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Into Condition Co g or estimating lee parian category in  parian category in	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Coungth and width. Coungth and width. Coungth and width. Coungth and depths; wo res. Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provious and leafy det al Category	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	Cl= (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the %  Right Bank  Left Bank  Jundercut banks.	Tree stratum (dbh: with > 60% tree co. non-maintained un located within th located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  M Riparian Area> Score >  M HABITAT: Vi. root mats; SAV; r	Assess both bank  imal  - 3 inches) present, enopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.1  100% 1.1  aried substrate si iffle poole comple	Con Subo Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Sinto Condition C g or estimating le parian category in  zes, water velocit ixxes, stable featur  Subo Stable habitat elei	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  Blocks en  High  Deliver to the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%	Cl= (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2	
Condition Scores Delineate rip Edescriptors Deli	Tree stratum (dbh: with > 60% tree co. non-maintained un located within th located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  M Riparian Area> Score >  M HABITAT: Vi. root mats; SAV; r	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.1  100% 1.1  aried substrate si iffle poole comple imal re typically present	Con Subo Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Cinto Condition C g or estimating le parian category in  zees, water velocit ixxes, stable featur  Subo Stable habitat ele present in 30-50% are adequate fo	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Lategories and Co ngth and width. Co ngth and depths; wo res. Conditiona ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided at Category  Mar.  Stable habitat ele present in 10-30% are adequate for are provided at Category  Mar.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory. Low  0.75  sing the ovided for you  pris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%	Cl= (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor N/A CSX R2SB3 02070010 10/30/15 02-STR-130 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> Culverts and Conditional Category Moderate embankments, spoil piles, constrictions, livestock gabion baskets. Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. SCORE 1.5 0.5 1.3 1.1 0.9 0.7 0.90 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF **INSERT PHOTOS:** Top Left: view of stream in gasline ROW Top Right: View of stream toward culvert under railroad Bottom Right: Typical view of stream away from railroad DESCRIBE PROPOSED IMPACT:

NC DWQ Stream Identification Form Version 4.11 Long Branch 02-STR-13c

Date: 10/30/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.766626
Evaluator: J. Budnik, M. Rockwell	County: Fairfax	Longitude: -77.166558
<b>Total Points:</b> 36.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*	Epnemeral inte	rmittent Perenn	e.g. Quad Name:	
A. Geomorphology (Subtotal = 19.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
Sinuosity of channel along thalweg	0	1	2	(3)
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	€3)
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $4.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No	) <del>=</del> (0)	Yes :	= 3
C. Biology (Subtotal = 12.5)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0)	1	2	3
22. Fish	0	0.5	1	1.5
				l

0

0

0

0.5

0.5

0.5

FACW = 0.75; OBL = 1.5 Other € 0

1.5

1.5

(1.5)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet: 03-C-STR-16 #5.

26. Wetland plants in streambed

Sketch:

23. Crayfish

25. Algae

24. Amphibians

		Sue		fied Stream M	lethodology f	or use in Virg	ginia				
Project #	ı	Project Name		Locality	nels classified a Cowardin Class.	s intermittent or	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2	RVA - Segme	ent 3	VA	R2SB	02070010	N/A		iongm	1 45151	
Name(	(s) of Evaluat	or(s)	Stream Nam	e and Informa	ation						
R	. Chojnacki				02-5	STR-14	(Long Bra	anch)			
Channel Co	ondition: Asse	ss the cross-sec	tion of the stream	and prevailing co	ondition (erosion,						
	Opti	mal	Subo	ptimal		ginal	Po	or	Sev	/ere	
	-	NA SAN	19			less than Severe or	Overwiden		1	5	
ondition	/ery little incision or 100% stable bar surface protection prominent (80-11 Stable point bars/l are present. Acce- floodplain or fully bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 10%). AND/OR pankfull benches so to their original developed wide Mid-channel bars, rs few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	ew areas of active cted banks. Majority table (60-80%), tion or natural rock-80%), AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, of floodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Veget 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe were bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious banks le Erosion/raw ban	on less than 20% of eventing erosion. oughing present.	
	sediment deposition 10% of b			rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depor	ks and stable		n bed is covered by outing to instability. channels and/or	•
Score	3		2	4	:	2	1.	6	1	1	2
RIPARIANI	BUFFFPS: A	sees both book					-STR-LongB		table)		
RIPARIAN	BUFFERS: A		's 100 foot riparia	an areas along the ditional Cateo ptimal	e entire SAR. (roo	ugh measuremen		h may be accep	NOTES>> A	50% of the	
Riparian <sup>™</sup> .	Opti  Free stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a lerstory. Wetlands	's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & wid	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> A from aerial and reach is and maintained railroad, and surface. The of the left be appears to be urban fores remainder of bank appea about 60% of	50% of the nixture of area, d paved e remainder bank be 50% t. The of the right rs to be urban	
Riparian T. Buffers	Opti  Free stratum (dbh > with > 60% tree ca non-maintained unc	mal  3 inches) present, nopy cover and a lerstory. Wetlands	's 100 foot riparia  Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> A from aerial and reach is and maintained railroad, and surface. The of the left be appears to a urban fores remainder of bank appea about 60% of forest and 4	50% of the nixture of area, d paved e remainder bank be 50% t. The of the right rs to be urban 10%	
Riparian <sup>™</sup> .	Opti  Free stratum (dbh > with > 60% tree ca non-maintained unc	mal  3 inches) present, nopy cover and a lerstory. Weltands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> A from aerial and reach is and maintained railroad, and surface. The of the left be appears to be urban fores remainder of bank appea about 60% of	50% of the nixture of area, d paved e remainder bank be 50% t. The of the right rs to be urban lo% area	
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Riparian Buffers Condition Scores Delineate riparic criptors. Determine squaw. Enter the % Rip	Opti  Free stratum (dbh > with > 60% tree ac ac non-maintained uncon-maintained unco-maintained uncon-maintained uncon-maintained unco-maintained unco-maintained unco-maintaine	3 inches) present, nopy cover and a lerstory. Wellands or riparian areas.	Con Subop High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Into Condition Co g or estimating le parian category in 15%	ditional Categorium All Categorium A	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prov.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> A from aerial and reach is and maintained railroad, and surface. The of the left be appears to a urban fores remainder of bank appea about 60% of forest and 4 maintained	50% of the nixture of area, d paved e remainder bank be 50% t. The of the right rs to be urban lo% area	
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Riparian Buffers Condition Scores Delineate riparia criptors. Determine squa w. Enter the % Rip ight Bank	Opti  Free stratum (dbh > with > 60% tree ca non-maintained uncon-maintained uncon-maintained uncoted within the located within	mal  3 inches) present, nopy cover and a lerstory. Wetlands in parian areas.	Con Subop High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating le parian category in 15% 0.6	ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth blocks below  20%  0.75	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prov.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> A from aerial areach is a maintained railroad, and surface. The of the left be appears to a urban fores remainder of bank appea about 60% of forest and 4 maintained adjacent the	50% of the nixture of area, d paved e remainder pank be 50% t. The of the right rs to be urban 10% area e railroad.	
Riparian Buffers  Condition Scores  Delineate riparic criptors. Determine squaw. Enter the % Rip ight Bank  9  NSTREAM	Opti  Free stratum (dbh > with > 60% tree ca non-maintained unce located within the locat	mal  3 inches) present, nopy cover and a lerstory. Wetlands in parian areas.  5  beach stream bani ach by measurin 35% 0.5 35% 0.5	Con Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating le parian category in 15% 0.6  15% 0.6  zes, water velocit	ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are prov. 30% 1.1	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed loits, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Al from aerial reach is a maintained railroad, and surface. The of the left be appears to lurban fores remainder obank appea about 60% of forest and 4 maintained adjacent the CI= (Sum % RA*S Rt Bank CI> Lt Bank CI>	50% of the nixture of area, d paved e remainder pank be 50% t. The of the right rs to be urban 100% area e railroad.	( <u> </u>
Riparian Buffers  Condition Scores  Delineate riparic criptors. Determine sque w. Enter the % Rip ight Bank  STREAM ercut banks; ro	Opti  Free stratum (dbh > with > 60% tree ca non-maintained unce located within the locat	mal  3 inches) present, nopy cover and a lerstory. Wetlands in parian areas.  5  beach stream bani ach by measurin 35% 0.5 35% 0.5	Con Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Into Condition Co g or estimating lee parian category in 15% 0.6	ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are prov.  30%  1.1	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  100%	NOTES>> A  from aerial ireach is a m maintained railroad, and surface. The of the left be appears to learn and are urban fores remainder of bank appea about 60% of forest and 4 maintained adjacent the  Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl> NOTES>> Ri structure, V	50% of the nixture of area, d paved e remainder pank be 50% t. The of the right rs to be urban 100% area e railroad.	
Riparian Buffers  Condition Scores  Delineate riparic criptors. Determine squaw. Enter the % Rip ight Bank  9  NSTREAM	Opti  Free stratum (dbh > with > 60% tree ca non-maintained unce located within the locat	mal  3 inches) present, nopy cover and a erestory. Wetlands riparian areas.  5  5  5  6  6  7  8  8  8  8  8  8  8  9  9  9  9  9  9	Con Subop High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 Cinto Condition Co g or estimating le parian category in 15% 0.6  15% 0.6  Zes, water velocit subop	ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and congth and congth and depths; wores.  Conditionaptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are prov.  30%  1.1	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum (abh >3 inches) present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Al from aerial reach is a maintained railroad, and surface. The of the left be appears to lurban fores remainder obank appea about 60% of forest and 4 maintained adjacent the CI= (Sum % RA*S Rt Bank CI> Lt Bank CI>	50% of the nixture of area, d paved e remainder pank be 50% t. The of the right rs to be urban 100% area e railroad.	
Riparian Buffers Condition Scores Celineate ripariac Criptors. Celetermine squaw. Enter the % Ripidit Bank STREAM Constream Habitat/ vailable	Opti  Tree stratum (dbh > with > 60% tree ca on-maintained uncolocated within the located	mal  3 inches) present, nopy cover and a erestory. Wetlands riparian areas.  5  5  5  6  6  7  8  8  8  8  8  8  8  8  9  9  9  9  9	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Cinto Condition Co g or estimating le parian category in 15% 0.6  15% 0.6  2es, water velocit xes, stable featur Subo Stable habitat ele present in 30-50%	can areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and depths; wores.  Conditional ptimal ments are typically & of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85 Indition Scores us Calculators are provided to the control of th	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with amaintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically % of the reach and	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e  Habitat elements lacking or are ur	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Al from aerial reach is a maintained railroad, and surface. The of the left beappears to lurban fores remainder obank appea about 60% of forest and 4 maintained adjacent the CI= (Sum % RA*S Rt Bank CI> Lt Bank CI> NOTES>> Ristructure, v. substrate, a	50% of the nixture of area, d paved e remainder pank be 50% t. The of the right rs to be urban 100% area e railroad.	
Riparian Buffers  Condition Scores  Celineate riparia criptors. Determine squa criptors. Enter the % Rip ight Bank  NSTREAM ercut banks; ronstream Habitat/	Opti  Free stratum (dbh > with > 60% tree aton-maintained una non-maintained una non-main	mal  3 inches) present, nopy cover and a lerstory. Wetlands in parlian areas.  5  beach stream banil ach by measurin 35% 0.5  35% 0.5  vied substrate si ffle poole comple mal  e typically present % of the reach.	Con Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating le parian category in 15% 0.6  15% 0.6  Subop Stable habitat ele present in 30-509 are adequate fo popul	can areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Acalculators are prov. 30% 1.1  Stable habitat ele present in 10-30% are adequate fo popul	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lois, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%  100%	NOTES>> Al from aerial reach is a maintained railroad, and surface. The of the left beappears to lurban fores remainder obank appea about 60% of forest and 4 maintained adjacent the CI= (Sum % RA*S Rt Bank CI> Lt Bank CI> NOTES>> Ristructure, v. substrate, a	50% of the nixture of area, d paved e remainder pank be 50% t. The of the right rs to be urban 100% area e railroad.	

	St	ream In	npact A	ssessm	ent For	m Pag	e 2				
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor		
N/A	csx		VA	R2SB	02070010	N/A	02-STR-14				
4. CHANNEL	L ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of ch	hannel, channeli	zation,	NOTES>> R	each		
	poil piles, constrictions, livestock		Conditiona					begins at ra	ilroad		
	Negligible	Mi	nor		erate	Se	vere	culvert.			
Channel Alteration	the parameter   the parameter   disrupted by any of the channel										
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			0.90	
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IIS REACH				
NOTE: The CIs and R	RCI should be rounded to 2 decimal places. T	he CR should be roun	ided to a whole number	er.				CONDITION INI			
								I= (Sum of all C		0	
						<u> </u>		X LF X IF	19		
INSERT PHO	OTOS:										
DESCRIBE F	PROPOSED IMPACT:										

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 10/30/2015

02-STR-14

Latitude:

Evaluator: J. Budnik, M. Rockwell	County: Fairfax		Longitude:		
<b>Total Points:</b> 0 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermittent (Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	1	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	No	0 = 0	Yes :	(3)	
a artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal =)					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	No	o = 0	Yes :	= 3	
C. Biology (Subtotal =)					
18. Fibrous roots in streambed	3	2	1	0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	1	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OBL	L = 1.5 Other = 0	)	
*perennial streams may also be identified using other methods.	. See p. 35 of manua	al.			
Notes: Long Branch. No access to stream.					
Sketch:					

			am A		lethodology f		_				
					nels classified a				I	lara t	
Project #	ı	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		RVA - Segme		VA	R2SB	02070010	10/29/15				
	e(s) of Evalua dnik, M. Roc	. ,	Stream Nam	e and Informa	ation	02.67	ΓR-15				
			tion of the atroom	and provoiling o	andition (arasian		IK-15				
. Chamilei C	Condition: Asse			С	Conditional Catego	ry					
	Opti	ımaı	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	1	- MAP	1	Je .	Often incised, but	less than Severe or	Overwidene	ed/incised.	1	5	
Channel Condition	surface protection prominent (80-1 Stable point bars/	nks. Vegetative n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	ew areas of active teted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR ures contribute to kifull and low flow II defined. Stream o bankfull benches, of floodplains along each. Transient	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se- temporary/tran instability. Depositi	stable than Severe wer bank slopes: seent on 40-60% of lative protection on Streambanks may rerut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to formind/present.	widen further. Maj	ority of both banks rosion present on cs. Vegetative at on 20-40% of ficent to prevent to 60-80% of the dby sediment. orary/transient in uting to instability.	incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sic Erosion/raw ban	stability. Severe tatained within the ad below average tajority of banks ut. Vegetative on less than 20% of eventing erosion. Doughing present. ks on 80-100%.	
	sediment deposition 10% of	on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protectic 40% of the bar sediment depos	on is present on > ks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by outing to instability. channels and/or	
Score	3	3	2	.4		2	1.	6	1		
NOTES>>			Banks	s have veget	tation. Field	Sheet: 03-C	-STR-14, Te	am C.			
	N BUFFERS: A	Assess both bank	's 100 foot riparia	an areas along the	e entire SAR. (ro		·			ome	
	N BUFFERS: A		s's 100 foot riparia		e entire SAR. (ro		·	h may be accep	NOTES>> S		
	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	h may be accep		h	
2. RIPARIAI Riparian Buffers Condition	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subor ripariar Con Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	un areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> S clearing wit	h	
Riparian Buffers  Condition Scores  Delineate rip descriptors. 2. Determine so	Tree stratum (dbh : with > 60% tree cc non-maintained una located within the located with	-3 inches) present, anopy cover and a deferstory. Wellands e riparian areas.  -5 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6 -6	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> S clearing wit	h	
Riparian Buffers  Condition Scores Delineate rip descriptors. Determine scelow. B. Enter the %	Tree stratum (dbh : with > 60% tree conon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a deststory. Weltands e riparian areas.	Con Subor High Suboptimal: Riparian areas with tree stratum (doh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> S clearing wit	h ne.	
Riparian Buffers  Condition Scores Delineate rip descriptors. Determine scelow. B. Enter the %	Tree stratum (dbh a with > 60% tree co non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each r  50%  0.85	Con Subo Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 50% 1.2	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> S clearing wit telephone li Cl= (Sum % RA * Si Rt Bank Cl >	ores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate rip descriptors. Determine scoledw. Enter the % Right Bank	Tree stratum (dbh a with > 60% tree co conon-maintained una located within the located wi	imal  3 inches) present, anopy cover and a deferstory. Wellands e riparian areas.  5  each stream ban each by measurin  Score for each r  50%  0.85	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 1.2	an areas along the ditional Categories and Council Categories and Categories and Council Categories and Categories an	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums sparian qual 100 100%	NOTES>> S clearing wit telephone li  Cl= (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	h ne.	
Riparian Buffers  Condition Scores  Delineate rip descriptors. Determine scoelow. Right Bank  Left Bank  B. INSTREAL	Tree stratum (dbh a with > 60% tree co non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands er iparian areas.  5  each stream ban each by measurin Score for each r 50% 0.85  50% 0.85  aried substrate si	Con Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 50% 1.2  50% 1.1  zes, water velocit	an areas along the ditional Categories and Congth and width. Congt	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums sparian qual 100 100%	NOTES>> S clearing wit telephone li Cl= (Sum % RA * Si Rt Bank Cl >	ores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate rip descriptors. Determine scoelow. Right Bank  Left Bank  B. INSTREAL	Tree stratum (dbh : with > 60% tree ca non-maintained un located within th located within th located within th strain areas along quare footage for e Riparian Area and % Riparian Area > Score > W HABITAT: Varoot mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  50%  0.85  50%  0.85  arried substrate si iffte poole comple	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 1.2  50% 1.1  zes, water velocit exes, stable features	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Coungth and width. Coungth and width. Coungth and width. Coungth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (bdh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, orther comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  ate; low embeded	Low Post Low Dother Conditions.  Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.	NOTES>> S clearing wit telephone li  Cl= (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	ores*0.01)/2	
Condition Scores  Delineate rip Bescriptors Determine scores Right Bank  Left Bank  Instream Habitat/	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands to riparian areas.  5  each stream ban each by measurin  Score for each r  50%  0.85  50%  0.85  aried substrate si iffle poole completimal	Con Subop  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Kinto Condition C g or estimating le parian category in 50% 1.2  50% 1.1  zes, water velocit exes, stable featur  Subop Stable habitat elei	an areas along the ditional Categories and Council Categories and Categories and Council Categories and Categories and Council Categories and Categ	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks et  Blocks et  High  Deliant of the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, conditions.  Low 0.5  Low 0.5  Low 100%  100%	NOTES>> S clearing wit telephone li  Cl= (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	ores*0.01)/2	
Condition Scores Delineate rip Jescriptors. Deltermine scoelow. Right Bank Left Bank B. INSTREAL Indercut banks;	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  50% each stream ban each by measuring Score for each rown on the stream ban on the stream ba	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 1.2  50% 1.1  zes, water velocit exes, stable featur Subo Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and depths; wo res.  Conditionaptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%	NOTES>> S clearing wit telephone li  Cl= (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	ores*0.01)/2	

	St	ream In	npact A	ssessm	ent For	m Pag	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	csx		VA	R2SB	02070010	10/29/15	02-STR-15		
	ALTERATION: Stream cross poil piles, constrictions, livestock		Conditiona	I Category				NOTES>> Control of the present due to the present d	
	Negligible	Mii	nor	Mod	erate	Sev	/ere	rain oaa.	
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	30% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or nent.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IIS REACH		
VOTE: The CIs and R	CI should be rounded to 2 decimal places. T	The CR should be roun	ded to a whole number	er.			THE REACH	CONDITION IND	DEX (RCI) >>
					'	•	RC	I= (Sum of all C	l's)/5

### INSERT PHOTOS:





Top Left: View upstream of culvert under railroad and large pool at base of culvert Top Right: Typical view of stream along railroad Bottom Left: Typical view of stream away from railroad

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 10/29/2015

02-STR-15

Latitude: 38.760892

Evaluator: J. Budnik, M. Rockwell  Total Points: 37	County: Fairfax		Longitude: -77	.173645
Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 15.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	No	0 = 0	Yes =	=(3)
a artificial ditches are not rated; see discussions in manual	•	•		
B. Hydrology (Subtotal = 8.5)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1)	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes =	<b>€</b> 3)
C. Biology (Subtotal = <u>13</u> )	_			
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5	1)	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	1)	1.5
26. Wetland plants in streambed		FACW = 0.75; OBL	_ = 1.5 Other <b>€</b> 0	
*perennial streams may also be identified using other met	hods. See p. 35 of manua	ıl.		
Notes: Stream surveyed day after large rain ev	ent on 10/28/2015. S	So very high flow rat	e observed. Fie	ld Sheet:
03-C-STR-14.				
Sketch:				

		Stre	Unit	fied Stream N	lethodology f	for use in Virg		m 1)			
		n N			nels classified a	s intermittent or		212 "	Impact/SAR	Impact	
Project #		Project Name	9	Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		RVA - Segme		VA	R4SB3	02070010	10/29/15				
	e(s) of Evalua dnik,  M. Roc		Stream Nam	e and Informa	ation	02.67	ΓR-16				
	ondition: Asse		tion of the atroom	and provoiling a	andition (arasian		IK-10				
Channel				C	Conditional Catego	ry					
	Opti	imal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	1	Who have	Slightly incised for	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		Deeply incised	(or even stad)	
Channel Condition	Very little incision of 100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse be	n or natural rock, 00%). AND/OR bankfull benches ess to their original developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to skfull and low flow II defined. Stream to bankfull benches, d floodplains along	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Sei temporary/tran instability. Depositi	ower bank slopes. resent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be isient, contribute on that contribute to forming/present.	widen further. Maji are near vertical. E 60-80% of banl protection presei banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sk. Erosion/raw ban	stability. Severe tained within the do below average tajority of banks ut. Vegetative in less than 20% of venting erosion. Dughing present. ks on 80-100%.	
	sediment depositio	n covers less than	sediment cover	reach. Transient is 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the bar	on is present on > aks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1		1.6
NOTES>>	Current b	ank stabiliz	ation presei	•		S-STR-13, Te		lave a lot o	f evidence o	r erosion.	
. RIPARIAI	N BUFFERS: A	Assess both bank	•	*	,	ugh measuremen	ts of length & widt	h may be accep			
	Opti	imal		ditional Cate		ginal	Po	or	NOTES>>		
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, iriparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
			High	Low	High	understory.	High	Low			
Condition Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
Delineate ripa escriptors. Determine so elow.	arian areas along of the large footage for e	each by measurin	g or estimating le	ngth and width. (	Calculators are pr		Ensure the of % R	iparian			
Right Bank	% Riparian Area>	50%	25%	25%				100%			
	Score >	0.5	0.85	1.1					CI= (Sum % RA * S	cores*0.01)/2	
Left Bank	% Riparian Area>	50%	25%	25%				100%	Rt Bank CI >	0.74	CI
	Score >	0.5	0.85	1.1					Lt Bank Cl >	0.74	0.74
	M HABITAT: Va root mats; SAV; ri				ody and leafy deb	bris; stable substr	ate; low embeded	ness; shade;	NOTES>>		
Instream				Conditiona			1				
Habitat/	Opti	imal		ptimal ments are typically		ginal ments are typically	Po Habitat elements				
Available		re typically present	present in 30-50%	6 of the reach and	present in 10-309	% of the reach and	lacking or are ur	stable. Habitat			
Cover	in greater than 5	0% of the reach.	are adequate to	r maintenance of	are adequate to	or maintenance of	elements are typical	ally present in less		ŀ	
Cover Score	In greater than 5		popul	r maintenance of ations.	popul	or maintenance of lations.	elements are typica than 10% of	the reach.			CI 0.90

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Date Data Point SAR length Impact Factor Project # N/A R4SB3 02070010 10/29/15 02-STR-16 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed i srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. SCORE 1.5 0.5 1.3 1.1 0.9 0.7 0.90

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

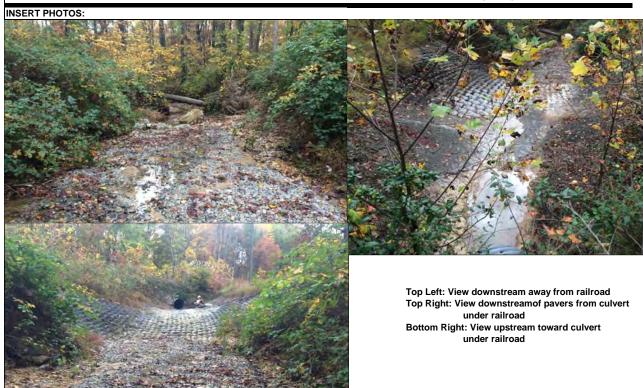
THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF



NC DWQ Stream Identification Form Version 4.11

02-STR-16

Date: 10/29/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.757686
Evaluator: J. Budnik, M. Rockwell	County: Fairfax	Longitude: -77.176128
<b>Total Points:</b> 21.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 10.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0)	1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	lo =(0)	Yes	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 4)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1)	2	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	0	(0.5)	1	1.5

 14. Leaf litter
 1.5
 1
 0.5
 0

 15. Sediment on plants or debris
 0
 0.5
 1
 1.5

 16. Organic debris lines or piles
 0
 0.5
 1
 1.5

 17. Soil-based evidence of high water table?
 No =0
 Yes = 3

C. Biology (Subtotal =  $\frac{7}{}$ 

/		_		
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	(.5)	1	1.5
26. Wetland plants in streambed		FACW = 0.75: (	OBL = 1.5 Other <b>€</b> (	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream has large amounts of channelization. It has sand-cement bag revetments for a portion. Field Sheet: 03-C-STR-13.

Sketch: 1: Culler Constitution on the Sketch of the Sketch

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
				wadeable chan	nels classified a				Impact/SAR	Impact	
Project #		Project Name	•	Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		RVA - Segme		VA	R4SB3	02070010	10/29/15				
	e(s) of Evaluated in the edge of the edge	. ,	Stream Nam	e and Informa	ation	02-S	ΓD 17				
	Condition: Asse		tion of the atroom	and provoiling o	andition (arasian		IK-17				
Channel				C	onditional Catego	ry					
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
		AND STATES	Slightly incised, for	ew areas of active	Poor. Banks more	less than Severe or stable than Severe	Overwidene Vertically/laterally u	unstable. Likely to	Deeply incised	(or excavated).	
Channel Condition	Very little incision of 100% stable bar surface protection prominent (80-1) Stable point bars/are present. Acce floodplain or fully bankfull benches. and transverse be	n or natural rock, 00%). AND/OR bankfull benches as to their original of developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock- -80%) AND/OR tures contribute to hkfull and low flow Il defined. Stream o bankfull benches, id floodplains along reach. Transient	Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sed temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Major are near vertical. E 60-80% of banh protection preser banks, and is insurerosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape.	rosion present on ks. Vegetative nt on 20-40% of fficient to prevent & 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present obanks, is not pre Obvious bank sik Erosion/raw ban	stability. Severe tained within the do below average hajority of banks ut. Vegetative on less than 20% of venting erosion. Dughing present. ks on 80-100%.	
	sediment depositio		sediment cover	reach. Transient rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the bark sediment depos	on is present on > iks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	CI
Score	3	3	2	.4	:	2	1.	6	1	ı	2.0
							-p	eet: 03-C-S	•		
RIPARIAI	N BUFFERS: A		Con	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep	table)	hannel	
RIPARIAI Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	imal  3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the	e entire SAR. (roo	•	•	h may be accep	table)	hannel ph shrub d areas. ction is evident. culvert is	
Riparian Buffers	Opti  Tree stratum (dbh - with > 60% tree ca	imal  3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	NOTES>> C goes throug and forested But constru disturbance Area above	hannel ph shrub d areas. ction is evident. culvert is	
Riparian Buffers	Opti  Tree stratum (dbh - with > 60% tree ca	imal 3 inches) present, anopy cover and a destroyr. Wellands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, active feed tots, trails, active feed conditions.	NOTES>> C goes throug and forested But constru disturbance Area above	hannel ph shrub d areas. ction is evident. culvert is	
Riparian Buffers  Condition Scores  Delineate ripasscriptors. Determine scolow.	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	imal  3 inches) present, anopy cover and a defension. Wellands e riparian areas.  5  each stream ban ach by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutvoer (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tweth < 30% tree canopy cover with maintained understory.  Low  0.75  sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	NOTES>> C goes throug and forested But constru disturbance Area above	hannel ph shrub d areas. ction is evident. culvert is	
Riparian Buffers  Condition Scores  Delineate rips Secriptors. Determine Scolow. Enter the % I	Tree stratum (dbh > with > 60% tree canon-maintained und located within the	imal  3 inches) present, nopy cover and a derstory. Wetlands er iparian areas.  5  bach stream ban ach by measuring	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tweth < 30% tree canopy cover with maintained understory.  Low  0.75  sing the	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> C goes throug and forested But constru disturbance Area above lacking tree	channel gh shrub d areas. ction is evident. culvert is layer.	
Riparian Buffers  Condition Scores  Delineate ripasscriptors. Determine scolow.	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	imal 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban ach by measurin Score for each r 50% 0.85	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.5	an areas along the ditional Categories and Council Categories and Categories and Council Categories and Categories and Council Categories and Categ	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tweth < 30% tree canopy cover with maintained understory.  Low  0.75  sing the	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	NOTES>> C goes throug and forester But constru disturbance Area above lacking tree	channel ph shrub d areas. ction is evident. culvert is layer.	CI
Riparian Buffers  Condition Scores  Delineate rips scriptors. Determine scolow. Enter the % I Right Bank	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal 3 inches) present, anopy cover and a distribution of the series of	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leeparian category in 25% 0.5	an areas along the ditional Categories and Council Categories and Categories and Council Categories and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are province.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stablized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ex	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	NOTES>> C goes throug and forested But constru disturbance Area above lacking tree	channel gh shrub d areas. ction is evident. culvert is layer.	CI 0.81
Riparian Buffers  Condition Scores  Delineate rips scriptors. Determine sclow. Enter the % I	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	5  sach stream ban ach by measurin 50% 0.85 25% 0.85 aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.5  25% 0.5  Zes, water velocit	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 25% 0.75  50% 1.1  by and depths; wores.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prove.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stablized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ex	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	NOTES>> C goes throug and forester But constru disturbance Area above lacking tree	channel ph shrub d areas. ction is evident. culvert is layer.	
Riparian Buffers  Condition Scores  Delineate ripisoriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	5  sach stream ban sach by measurin Score for each r 50% 0.85 25% 0.85 aried substrate siffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.5  25% 0.5  zes, water velocit exes, stable feature	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and County and the blocks below 25% 0.75  50% 1.1  by and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the control of the con	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (6th > 3 inches) present, with <a>20</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed	Low Post Ingerial Conditions of the Sums Ingerial Conditions.  Low 0.5	NOTES>> C goes throug and forested But constru disturbance Area above lacking tree	channel ph shrub d areas. ction is evident. culvert is layer.	
Riparian Buffers  Condition Scores  Delineate rip. Secriptors. Determine scolow. Enter the % I Right Bank  Left Bank  INSTREAI dercut banks; Instream Habitat/ Available	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands er liparian areas.  5  each stream ban each by measuring the stream ba	Con Suboy High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.5  25% 0.5  zes, water velocit exes, stable featur  Suboy Stable habitat elpresent in 30-50%	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (congth and width. (congth and width. (congth and width.) (congth and width.) (congth and depths; wores.  Conditional ments are typically for the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (6th > 3 inches) present, with <a>20</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you  ginal  ments are typically % of the reach and	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed  Habitat elements lacking or are un	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> C goes throug and forested But constru disturbance Area above lacking tree	channel ph shrub d areas. ction is evident. culvert is layer.	
Condition Scores  Delineate rip: Secriptors. Determine scolow. Enter the % I Right Bank  Left Bank  INSTREAL Instream Habitat/	Tree stratum (dbh > with > 60% tree co non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands er liparian areas.  5  each stream ban each by measuring the stream ba	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.5  25% 0.5  zes, water velocit exes, stable featur  Subo  Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Categories and County (dense vegetation).  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and County and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ee Blocks	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> C goes throug and forested But constru disturbance Area above lacking tree	channel ph shrub d areas. ction is evident. culvert is layer.	

	St	ream In	npact A	ssessm	ent For	rm Page	e 2		
Project#	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	csx		VA	R4SB3	02070010	10/29/15	02-STR-17		
	- ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, conc		al Category				NOTES>> Channeliza	tion.
	Negligible	Mi	nor	Mod	erate	Sev	rere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed			
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

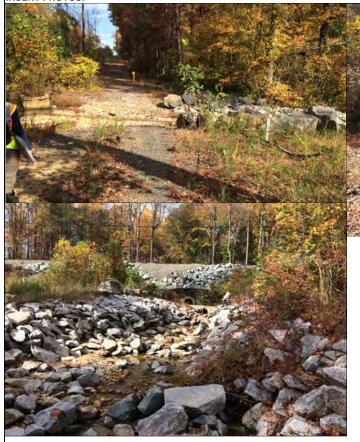
RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View of gasline ROW crossing stream parallel to railroad

Top Right: View of culvert under railroad

Bottom Left: View upstream toward culvert under railroad

NC DWO Stream Identification Form Version 4.11

A. Geomorphology (Subtotal = 15.5

1<sup>a.</sup> Continuity of channel bed and bank

02-STR-17

**Strong** 

Date: 10/29/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.754886
Evaluator: J. Budnik, M. Rockwell	County: Fairfax	Longitude: -77.177652
<b>Total Points:</b> 32.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral (intermittent Perennial	Other e.g. Quad Name:

**Absent** 

Weak

Moderate

(2)

FACW = 0.75; OBL = 1.5 Other € 0

1 Continuity of charmer bed and bank	0	'		9
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0=(0)	Yes	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 6				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1_	2)	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	N	0=(0)	Yes	= 3
C. Biology (Subtotal = 11 )	_			
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1)	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	(1)	1.5

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream has channelization and construction elements. There is a pipe installed under the access road to guide stream under the channel. Channel is then lined with riprap guiding stream to a culvert. Field Sheet: 03-C-STR-12.

Sketch:

26. Wetland plants in streambed

		Stre					(For	m 1)			
				fied Stream N wadeable chan							
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		RVA - Segme		VA	R4SB	02070010	10/29/15				
	e(s) of Evaluat	· ·		00.0	FD 40						
	idnik, M. Roc Condition: Asse		tion of the atroop	and provoiling o	andition (areaisn		ΓR-18				
Channer	Opti				Conditional Catego		Po	Or.	Sou	rere	
	- Opti	IIIai	Subo	ptimai	IVIAI	giriai	¥	OI	Jev	//	
	"Value	موريد المولا	Slightly incircle f	ew areas of active		less than Severe or stable than Severe	Overwiden Vertically/laterally		1	<b>5</b>	
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-10 Stable point bars/t are present. Acces floodplain or fully	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ss to their original developed wide	erosion or unproter of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we	exted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches,	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute	widen further. Maj are near vertical. E 60-80% of banl protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is tempo	ority of both banks crosion present on ks. Vegetative on 20-40% of fficient to prevent 60-80% of the ed by sediment.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, n vertical/underc protection present of banks, is not pre	eut. Vegetative on less than 20% of eventing erosion.	
	bankfull benches. I and transverse ba sediment deposition 10% of b	rs few. Transient n covers less than	or newly develope portions of the r sediment cover	or banktin benches, of floodplains along reach. Transient rs 10-40% of the bottom.	instability. Depositi stability, may be AND/OR V-shap vegetative protecti banks and depositi	on that contribute to forming/present. ed channels have ion on > 40% of the ional features which to stability.	AND/OR V-shape vegetative protecti 40% of the bar sediment depos	buting to instability.  ed channels have  on is present on >  nks and stable	Erosion/raw ban AND/OR Aggradin	g channel. Greater n bed is covered by outing to instability. channels and/or	CI
Score	3	1	2	.4		2	1.	6	1	l	2.0
RIPARIAI	N BUFFERS: A	ssess both bank		an areas along the	e entire SAR. (ro	Sheet: 03-C		h may be accep	1	he hanka	
RIPARIAI			Con	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt		NOTES>> T		
	Optil  Tree stratum (dbh > with > 60% tree canon-maintained und located within the	mal  3 inches) present, nopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy	e entire SAR. (ro	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained			NOTES>> T of the streal to have bee with grass a uniform inte	m appear n planted and trees at	
Riparian	Option  Tree stratum (dbh > with > 60% tree canon-maintained und	mal  3 inches) present, nopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active fee lots, trails, or other comparable conditions.	NOTES>> T of the streal to have bee with grass a uniform inte	m appear n planted and trees at	
Riparian Buffers	Option  Tree stratum (dbh > with > 60% tree canon-maintained und	mal  3 inches) present, nopy cover and a derstory. Wellands e riparlan areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> T of the streal to have bee with grass a uniform inte	m appear n planted and trees at	
Riparian Buffers  Condition Scores  Delineate ripasscriptors. Determine scopelow.	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a retrstory. Wellands a riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Coungth and width. Coung	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100	NOTES>> T of the streal to have bee with grass a uniform inte	m appear n planted and trees at	
Riparian Buffers  Condition Scores  Delineate rips Secriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a lerstory. Weltands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in 25%	an areas along the ditional Categories and Congress and C	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt of % R	Low Poor: Impervious surfaces, mine spoil lands, dendued surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> T of the streal to have bee with grass a uniform inte	m appear n planted and trees at	
Riparian Buffers  Condition Scores  Delineate rip. Scriptors. Determine sciow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a retrstory. Wellands a riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Coungth and width. Coung	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100	NOTES>> T of the streal to have bee with grass a uniform inte	m appear n planted and trees at ervals.	
Riparian Buffers  Condition Scores  Delineate rips Secriptors. Determine Scolow. Enter the % I	Tree stratum (dbh > with > 60% tree ca anon-maintained und located within the located wit	mal  3 inches) present, nopy cover and a leterstory. Wetlands riparian areas.  5  each stream ban ach by measurin 25%  0.6  25%	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.85	an areas along the ditional Categories and Congth and width. Can the blocks below 50%	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100	NOTES>> T of the stream to have bee with grass a uniform inte  Cl= (Sum % RA * S Rt Bank Cl >	m appear n planted and trees at ervals.	CI 0.91
Riparian Buffers  Condition Scores  Delineate rips scriptors. Determine sclow. Enter the % I	Tree stratum (dbh > with > 60% tree ca anon-maintained und located within the located wit	mal  3 inches) present, nopy cover and a terstory. Wetlands e riparian areas.  5  seach stream ban ach by measurin Score for each r 25% 0.6	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le containing le conta	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth cutows the blocks below 1.1	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh 2) inches) present, with <30% tree canopy cover.  High  0.85  Indicators are provided to the control of the co	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area and stabilized, or other comparable condition.  High  0.6  Ensure to the stabilized of t	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> T of the stream to have bee with grass a uniform inte  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	m appear n planted and trees at ervals.	CI 0.91
Riparian Buffers  Condition Scores  Delineate rips scriptors. Determine sclow. Enter the % I	Tree stratum (dbh > with > 60% tree ca anon-maintained und located within the located wit	mal  3 inches) present, nopy cover and a leterstory. Wetlands in partial areas.  5  beach stream ban ach by measurin 25% 0.6  25% 0.6  arried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.85	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Con the blocks below 50% 1.1  by and depths; wores.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Academic Scores us Calculators are provinced to the second of the secon	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area and stabilized, or other comparable condition.  High  0.6  Ensure to the stabilized of t	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> T of the stream to have bee with grass a uniform inte  Cl= (Sum % RA * S Rt Bank Cl >	m appear n planted and trees at ervals.	
Riparian Buffers  Condition Scores  Delineate rip: sscriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	mal  3 inches) present, nopy cover and a leferstory. Wetlands riparian areas.  5  sach stream ban ach by measuring 25%  0.6  25%  0.6  uried substrate siffle poole complete.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.85  25% 0.85	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provinced to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iiparian qual 100 100%  100%	NOTES>> T of the stream to have bee with grass a uniform inte  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	m appear n planted and trees at ervals.	
Condition Scores  Delineate ripesscriptors. Determine Scelow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/ Available	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	mal  3 inches) present, nopy cover and a leferstory. Wetlands riparian areas.  5  ach stream ban ach by measuring 25% 0.6  25% 0.6  aried substrate siffle poole complete the poole comp	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.85  25% 0.85  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Con the blocks below 50% 1.1  ty and depths; wo res.  Conditiona ptimal ments are typically & of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present with sample of the sample of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically % of the reach and	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks et al. Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed olots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%  100%	NOTES>> T of the streat to have bee with grass a uniform inte  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	m appear n planted and trees at ervals.	
Condition Scores  Delineate rip: Socriptors. Determine scolow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree ca anon-maintained und located within the located wit	mal  3 inches) present, nopy cover and a leterstory. Wetlands in partial areas.  5  beach stream ban ach by measurin 25% 0.6  25% 0.6  aried substrate siffle poole comple mal  te typically present 1% of the reach.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.85  25% 0.85  Zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	an areas along the ditional Categories and Congth and width. Categories and Congth and C	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh 3 inches) present, with <30% tree canopy cover.  High 0.85  Calculators are provided to the control of the con	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  O.6  Ensure the of % R Blocks etc.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%  100%	NOTES>> T of the streat to have bee with grass a uniform inte  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	m appear n planted and trees at ervals.	

Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB	02070010	10/29/15	02-STR-18		
	- ALTERATION: Stream cross poil piles, constrictions, livestock	sings, riprap, conc		concrete blocks,	straightening of ch	hannel, channeliz	ation,	NOTES>> Stappears to l	be
	Negligible	Mi	nor	Mod	erate	Severe		constructed.	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed	y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

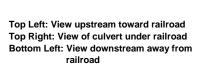
COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:





NC DWQ Stream Identification Form Version 4.11

02-STR-18

Date: 10/29/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.752110
Evaluator: J. Budnik, M. Rockwell	County: Fairfax	Longitude: -77.179314
<b>Total Points:</b> 20.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral (intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 10)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1)	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	lo <b>=</b> (0)	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 3				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	(0)	1_	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(1.5)	1	1.5
17 Soil-based evidence of high water table?	N	0 = (1)	Yes	<b>–</b> 3

10. Holl oxidizing bacteria		l <u>-</u>	_	_
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	N	lo <b>=</b> (0)	Yes:	= 3
C. Biology (Subtotal = 7.25)				

C. Biology (Subtotal = $7.25$		_		
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW =(0.75)	OBL = 1.5 Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream has channelization. Evidence of riprap, gravel, grass and tree plants on both banks; uniform plantings.

Channel near stream that may have been original stream channel for STR-11. Field Sheet: 03-C-STR-11 Sketch:

Score 3 2.4 2 1.6 1  NOTES>> Some inclision is present. Field Sheet: 03-C-STR-10, Team C.  2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Righ Subop			Stre			ment lethodology f		(For	m 1)			
NA DCZRVA - Segment 3 VA R4839 0207001 10/20/15   VARAPINO CONTROL	<b>D</b>		Desired No.						0.45 "	Impact/SAR	Impact	
Channel Condition: Assess the cross-section of the stream and prevaling condition (crossor), against and the condition of the stream and prevaling condition (crossor), against and the condition of the stream and prevaling condition (crossor), against and the condition of the	Project #		Project Name	•	Locality		HUC	Date	SAR#			
Channel Channe							02070010	10/29/15				
Chamel Ch				Stream Name	e and Informa	ation	02.61	ΓD 10				
Channel Channe				tion of the atroom	and provailing a	andition (arasian		IK-19				
Channel Condition  Channel Condition  Solve stable stable. Separate more stable on the Source stable	. Chamilei C				C	onditional Catego	ry					
Channel Condition		Opti	ımaı	Subo	ptimai	Mar	ginai	Po	or	Sev	ere	
Condition  Condition  Condition  To estimate (60% 3 inches)  Condition  Condition  To estimate (60% 3 inches)  Condition  Condition  To estimate (60% 3 inches)  Condition  To estimate (60% 3 inches)  Condition  Condition  To estimate (60% 3 inches)  Condition  To estimate (60% 3 inches)  Condition  To estimate (60% 3 inches)  Condition  Condition  To estimate (60% 3 inches)  Condition  Condition  To estimate (60% 3 inches)  Condition  Condition  To estimate (60% 3 inches)  Condition  To estimate (60% 3 inches)  Condition  To estimate (60% 3 inches)  Condition  Condition  To estimate (60% 3 inches)  Condition  Cond			Who was a series of the series	Slightly incised, fe	ew areas of active	Poor. Banks more	stable than Severe	Vertically/laterally	unstable. Likely to	Deeply incised	(or excavated).	
Score 3 2.4 2 1.6 1  RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire strain with the strain with		100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches, and transverse bar	nks. Vegetative n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient	of banks are st Vegetative protect prominent (60- Depositional feat stability. The ban channels are wel likely has access to or newly developed	able (60-80%). ion or natural rock 80%) AND/OR ures contribute to kfull and low flow I defined. Stream b bankfull benches, d floodplains along	Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Set temporary/tran instability. Depositiv.	esent on 40-60% of tative protection on Streambanks may crcut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	are near vertical. E 60-80% of banl protection presel banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib	rosion present on ks. Vegetative nt on 20-40% of fficient to prevent & 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in: incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sk Erosion/raw ban	stability. Severe tained within the do below average tajority of banks ut. Vegetative on less than 20% of venting erosion. Dughing present. ks on 80-100%.	
NOTES>>  Some incision is present. Field Sheet: 03-C-STR-10, Team C.  RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  NOTES>> Stream flows through pipeline control of the control of				sediment cover	s 10-40% of the	vegetative protecti banks and depositi	on on > 40% of the onal features which	40% of the bar	ks and stable	than 80% of stream deposition, contrib Multiple thread of	bed is covered by outing to instability. channels and/or	CI
RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  High Suboptimal  High Suboptimal:  High Suboptimal:  Which Suboptimal:  High Suboptimal:  High Suboptimal:  Riparian areas:  Which sa anches)  If ree stratum (dbh > 3 inches) present, with > 30% inches and present with > 30% inches and pre	Score	3	3	2	.4		2	1.	6	1		2.0
Condition   Subspiring   Figure   Fig		N BUFFERS: A	Assess both bank	t's 100 foot riparia	n areas along the	e entire SAR. (ro				otable)		
Riparian areas and score for each by measuring or estimating length and width. Calculators are provided for you bettermine square footage for each by measuring or estimating length and width. Calculators are provided for you letter share square footage for each by measuring or estimating length and width. Calculators are provided for you letter share square footage for each by measuring or estimating length and width. Calculators are provided for you letter share square footage for each by measuring or estimating length and width. Calculators are provided for you letter share square footage for each by measuring or estimating length and width. Calculators are provided for you letter share square footage for each by measuring or estimating length and width. Calculators are provided for you letter share square footage for each priparian areas along each stream bank into Condition Categories and Condition Scores using the letter the square footage for each by measuring or estimating length and width. Calculators are provided for you letter share square footage for each by measuring or estimating length and width. Calculators are provided for you letter share square footage for each priparian category in the blocks below.  Right Bank  Right and Area and Score for each riparian category in the blocks below.  Score > 0.85 1.1  Left Bank  Right and Area and Score for each riparian category and depths; woody and leafy debris; stable substrate; low embeddeness; shade; letter shared by conditional category.  Score > 0.85 1.1  Score > 0.85 1.1  Score > 0.85 1.1  Subshabitatelements are typically present in greater than 50% of the reach.  Score of the reach.  Subshabitatelements are typically present in greater than 50% of the reach.  Subshabitatelements are typically present in greater than 50% of the reach.  Subshabitatelements are typically present in greater than 50% of the reach.		Onti	imal				ginal	Po	or			
Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the secriptors.   Deletermine square footage for each by measuring or estimating length and width. Calculators are provided for you better the % Riparian Area and Score for each riparian category in the blocks below.   Enter the % Riparian Area and Score for each riparian category in the blocks below.   Right Bank   Microscopies   Micro		Tree stratum (dbh : with > 60% tree canon-maintained und	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	corridor and through a w area.	then	
Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the secriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you alow.				High	Low	High	Low	High	Low			
Determine square footage for each by measuring or estimating length and width. Calculators are provided for you allow.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Enter the % Riparian Area 25% 75% 100%  Score > 0.85 1.1 1	Condition	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
Score >   0.85   1.1										-		
Left Bank    Migarian Area>   25%   75%   100%   Rt Bank Cl >   1.04   1.04	Scores  Delineate ripa escriptors. Determine squalow.	uare footage for e	each by measurin	g or estimating le	ngth and width. (	Calculators are pr		of % R	iparian qual 100			
Score > 0.85 1.1 Lt Bank Cl > 1.04 1.  INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; defected banks; root mats; SAV; riffle poole complexes, stable features.  Conditional Category  Optimal Suboptimal Marginal Poor  Habitat/ Available Cover Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.  Stable habitat elements are typically present in greater than 50% of the reach.  Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Delineate ripa escriptors. Determine sq elow. Enter the % F	uare footage for e	each by measurin Score for each r 25%	g or estimating le	ngth and width. (	Calculators are pr		of % R	iparian qual 100			
Instream Habitat/ Available Cover  Optimal Stable habitat elements are typically present in 10-30% of the reach. Stable habitat for maintenance of populations.  Coulditional Category  Marginal Marginal Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.  Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Scores  Delineate ripzescriptors. Determine squelow. Enter the % F  Right Bank	uare footage for e Riparian Area and % Riparian Area> Score >	Score for each r 25% 0.85	g or estimating let parian category ir 75% 1.1	ngth and width. (	Calculators are pr		of % R	iparian qual 100 100%		,	CI
Instream Habitat/ Available Cover  Coptimal  Conditional Category  Marginal  Marginal  Poor  Habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.  Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.  Habitat elements are typically present in less than 10% of the reach.	Delineate ripz escriptors. Determine sq slow. Enter the % F Right Bank	ware footage for e  Riparian Area and  Riparian Area>  Score >  % Riparian Area>	Score for each r 25% 0.85	g or estimating let parian category in 75% 1.1	ngth and width. (	Calculators are pr		of % R	iparian qual 100 100%	Rt Bank Cl >	1.04	CI 1.04
Habitat/ Available Cover    Habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.    Habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.    Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.    Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in loss of the reach.	Delineate ripa escriptors. Determine so elow. Enter the % F Right Bank Left Bank	Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Va	Score for each r 25% 0.85 25% 0.85	g or estimating let parian category ir 75% 1.1 75% 1.1 zes, water velocit	ngth and width. C	Calculators are pr	ovided for you	of % R Blocks er	iparian qual 100 100% 100%	Rt Bank CI >	1.04	
Available Cover   Habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.   I acking or are unstable. Habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.   I acking or are unstable. Habitat elements are typically present in 18-30% of the reach and are adequate for maintenance of populations.   I acking or are unstable. Habitat elements are typically present in 18-30% of the reach and are adequate for maintenance of populations.   I acking or are unstable. Habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.   I acking or are unstable. Habitat elements are typically present in 18-30% of the reach and are adequate for maintenance of populations.   I acking or are unstable. Habitat elements are typically present in 18-30% of the reach and are adequate for maintenance of populations.   I acking or are unstable. Habitat elements are typically present in 18-30% of the reach and are adequate for maintenance of populations.   I acking or are unstable. Habitat elements are typically present in 18-30% of the reach and are adequate for maintenance of populations.   I acking or are unstable. Habitat elements are typically present in 18-30% of the reach and are adequate for maintenance of populations.   I acking or are unstable. Habitat elements are typically present in 18-30% of the reach.   I acking or are unstable. Habitat elements are typically present in 18-30% of the reach and are adequate for maintenance of populations.   I acking or are unstable. Habitat elements are typically present in 18-30% of the reach and are adequate for maintenance of populations.   I acking or are unstable.   I acking or are	Delineate rips escriptors. Determine sq slow. Enter the % F Right Bank Left Bank	Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Va	Score for each r 25% 0.85 25% 0.85	g or estimating let parian category ir 75% 1.1 75% 1.1 zes, water velocit	ngth and width. Con the blocks below	calculators are prov.	ovided for you	of % R Blocks er	iparian qual 100 100% 100%	Rt Bank CI >	1.04	
populations. populations. than 10% of the reach.	Delineate rips escriptors. Determine sq slow. Enter the % F Right Bank Left Bank INSTREAM dercut banks; Instream	ware footage for e  Riparian Area and  Riparian Area>  Score >  Riparian Area>  Score >  Riparian Area>  Score >	Score for each r 25% 0.85 25% 0.85 aried substrate si	g or estimating let parian category in 75% 1.1 75% 1.1 zes, water velocit exes, stable featur	y and depths; wo	calculators are prov.  ody and leafy det  Category  Mars	ovided for you	of % R Blocks en	iparian qual 100 100% 100% ness; shade;	Rt Bank CI >	1.04	
Score 1.5 1.2 0.9 0.5	Delineate ripa escriptors. Determine sq elow. Enter the % F Right Bank  Left Bank  INSTREAM ndercut banks; Instream Habitat/ Available	% Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Varoot mats; SAV; r  Opti Habitat elements a	Score for each r 25% 0.85 25% 0.85 aried substrate si iffle poole completional	g or estimating let parian category ir 75% 1.1 75% 1.1 zes, water velocit exes, stable featur Subol Stable habitat eler present in 30-50%	y and depths; wo res.  Conditiona ptimal ments are typically 6 of the reach and	ody and leafy det  Category  Stable habitat ele present in 10-30%	ovided for you  oris; stable substr  ginal  ments are typically 6 of the reach and	of % R Blocks et	iparian qual 100 100% 100% 100%  Iness; shade;  Or listed above are stable. Habitat	Rt Bank CI > Lt Bank CI >	1.04	1.04

	St	ream In	npact A	ssessm	ent For	rm Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	csx		VA	R4SB3	02070010	10/29/15	02-STR-19		
	ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, conc		concrete blocks, s	straightening of ch	hannel, channeliz	ation,	NOTES>> As with culvert	
	Negligible	Mir	nor		erate	Sev	ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5		
	REACH C	ONDITION II	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:





Top Left: View of pool at culvert under railroad
Top Right: View of stream draining away from
railroad
Bottom Left: Typical view downstream away from

railroad

NC DWQ Stream Identification Form Version 4.11

02-STR-19

1.5

Date: 10/29/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.748772
Evaluator: J. Budnik, M. Rockwell	County: Fairfax	Longitude: -77.181597
<b>Total Points:</b> 20.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 10 )	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	(1.5)	1	1.5
11. Second or greater order channel	N	lo <b>=</b> (0)	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual		-		
B. Hydrology (Subtotal = $2.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(.5)	1	1.5
17. Soil-based evidence of high water table?	N	0 =(0)	Yes	= 3
C. Biology (Subtotal = $7.75$ )		_		
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0)	0.5	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	0	(0.5)	1	1.5

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream surveyed after large rain event on 10/28/15. Stream currently has a large amount of suspended sediments and is an opaque, muddy color. Field Sheet: 03-C-STR-10.

0.5

FACW = 0.75) OBL = 1.5 Other = 0

Sketch:

25. Algae

26. Wetland plants in streambed

		Stre		ssess			-	m 1)			
				fied Stream N wadeable chan							
Project #		Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Segment 3			VA	R4SB3	02070010	10/29/15				
	e(s) of Evalua dnik, M. Roc	. ,	Stream Nam	e and Informa	ation	02.67	ΓR-20				
	Condition: Asse		tion of the stream	n and prevailing co	ondition (erosion,		I K-20				
	Optimal				onditional Categor		Po	or	Sev	ere	
	1	WAR TO THE REAL PROPERTY OF THE PARTY OF THE	1			less than Severe or	Overwiden		1	5	
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully	Slightly incised, few areas of erosion or active erosion; 80- able banks. Vegetative otection or natural rock, it (80-100%). AND/OR it bars/bankfull benches t. Access to their original or fully developed wide inches. Mid-channel bars, or newly developed floodplains.			or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of known banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute		Vertically/laterally unstable. Likely to widen further. Majority of both banks if are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in		perpy included to exacutately, several incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious banks slow banks loan within present.		
	sediment deposition 10% of	on covers less than	sediment cover	reach. Transient rs 10-40% of the bottom.	AND/OR V-shape vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the onal features which to stability.		on is present on >		channels and/or	CI
Score	3	3	2	.4	:	2	1	.6	1		1.6
NOTES>>	I BIJEEEDS.							Sheet: 03-			
	N BUFFERS: A	Assess both bank	c's 100 foot riparia		e entire SAR. (rou		its of length & wid				
	Opti	Assess both bank imal  > 3 inches) present, aderstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy covered a	e entire SAR. (rou	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	its of length & wid	- th may be accep	NOTES>> B riprap mate some foliag associated woody vine	rials and e with a	
. RIPARIAN	Opti Tree stratum (dbh : with > 60% tree ca	Assess both bank imal  > 3 inches) present, aderstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 3 0% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with +30% tree canopy cover with	Pcc High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	NOTES>> B riprap mate some foliag associated woody vine	rials and e with a	
Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree ca	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	C's 100 foot riparia  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorium Low Suboptimal:  Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory.  Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	ts of length & wid  Pc  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed conditions.	NOTES>> B riprap mate some foliag associated woody vine	rials and e with a	
Riparian Buffers  Condition Scores  Delineate ripalescriptors. Determine squelelow.	Opti	Assess both bank imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Categorianal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & wid  Pro  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> B riprap mate some foliag associated woody vine	rials and e with a	
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Riparian Buffers  Condition Scores  Delineate ripa escriptors. Determine squelow. Enter the % F	Tree stratum (dbh a with > 60% tree conon-maintained una located within the located withi	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream baneach by measurin Score for each ri 100% 0.6	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Categorianal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & wid  Pcc  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to Web.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel conditions.  Low 0.5  he sums supportant qual 100 100%	NOTES>> B riprap mate some foliag associated woody vine	rials and e with a	CI
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Riparian Buffers  Condition Scores  Delineate ripe lescriptors. Determine squelow. Enter the % F Right Bank  Left Bank  B. INSTREAN	Tree stratum (dbh a with > 60% tree conon-maintained und located within the located withi	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 0.6  100% 0.6  arried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	an areas along the ditional Categories and Congth and width. Categories and Congth and C	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85 Indition Scores us Calculators are proven.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area dand stabilized, or other comparable condition.  High  0.6  Ensure to the stability of	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, ed lots, ed lo	NOTES>> B riprap mate some foliag associated woody vine  Cl= (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>> Ne	cores*0.01//2  0.60	
Riparian Buffers  Condition Scores  Delineate ripe lescriptors. Determine squelow. Enter the % F Right Bank  Left Bank  B. INSTREAN	Tree stratum (dbh : with > 60% tree canon-maintained un located within the located within	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin 100% 0.6  100% 0.6  aried substrate si iffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu	an areas along the ditional Categoretimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below the blocks below the present conditional conditional categories.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the control of the con	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (bdh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & wide state of length & wide length & wide length & wide length l	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums liparian qual 100 100%	NOTES>> B riprap mate some foliag associated woody vine.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01//2  0.60	
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Riparian Buffers  Condition Scores  Delineate ripe lescriptors. Determine so elow. Enter the % F Right Bank  Left Bank  B. INSTREAN Indercut banks; Instream	Tree stratum (dbh a with > 60% tree oc non-maintained und located within the located with	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin 100% 0.6  100% 0.6  aried substrate si iffle poole completimal  re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Categoretimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85 Indition Scores us calculators are present in 10-30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  pris; stable substr	ts of length & wide state of length & wide length & wide length & wide length l	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, active feed lots, trails or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Briprap mate some foliag associated woody vine  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>> Newtland.	cores*0.01//2  0.60	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Impact Factor Project # Date N/A CSX R4SB3 02070010 10/29/2015 02-STR-20 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> Banks have embankments, spoil piles, constrictions, livestock Conditional Category Moderate riprap. Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed i srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. SCORE 0.5 0.50 1.5 1.3 1.1 0.9 0.7 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

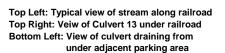
COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:





Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 10/29/2015

02-STR-20

Latitude: 38.74716940

Evaluator: J. Budnik, M. Rockwell	County: Fairfax		Longitude: -77.1822420		
<b>Total Points:</b> 21 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) mittent Perennial	Other e.g. Quad Name:		
	_			0.	
A. Geomorphology (Subtotal = 8 )	Absent	Weak	Moderate	Strong	
<sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3	
2. Sinuosity of channel along thalweg	0	1	(2)	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
Particle size of stream substrate	0	1	(2)	3	
5. Active/relict floodplain	(0)	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
3. Headcuts	0	1	2	3	
9. Grade control	0	0.5	(1)	1.5	
10. Natural valley	0	0.5	(1)	1.5	
11. Second or greater order channel	No	=(0)	Yes:	= 3	
artificial ditches are not rated; see discussions in manual	•				
3. Hydrology (Subtotal = 3.5)					
2. Presence of Baseflow	0	(1)	2	3	
3. Iron oxidizing bacteria	(0)	1	2	3	
4. Leaf litter	1.5	1	(0.5)	0	
5. Sediment on plants or debris	0	0.5	(1)	1.5	
6. Organic debris lines or piles	0	0.5	(1)	1.5	
7. Soil-based evidence of high water table?	-	=(0)	Yes:	_	
C. Biology (Subtotal = 9.5					
18. Fibrous roots in streambed	(3)	2	1	0	
19. Rooted upland plants in streambed	(3)	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3	
21. Aquatic Mollusks	0	(1)	2	3	
22. Fish	Ö	0.5	<u>-</u>	1.5	
23. Crayfish		(0.5)	1	1.5	
24. Amphibians	0	(0.5)	1	1.5	
25. Algae	0	(0.5)	1	1.5	
26. Wetland plants in streambed	0	FACW = 0.75; OBI		_	
*perennial streams may also be identified using other method	de Soon 25 of manual			)	
· · · · · · · · · · · · · · · · · · ·			it on both banks		
Notes: Field Sheet: 03-C-STR-09. Stream flows b		s. Riprap is preser	it on both banks	•	

Project & Project Assess that cross section of the steam and provaling condition (section age)  N/A DCRYA-Segment 3 VA R4SB3 02070010 10/29/15  Name(s) of Evaluator(s)  1. Budnik, M. Rockwell  1. Channel Condition: Assess the cross section of the steam and provaling condition (section, age) and the steam and provaling conditions (section, age) and the steam and provaling condition (section, age) and the steam and provaling conditions (section age			Stre	Uni	fied Stream N	lethodology f	or use in Virg		m 1)			
Name(s) of Evaluation(s)  J. Budnik, M. Rockwell  O2-STR-21  1. Channel Condition: Assess the costs section of the them and prevailing conflicts (remove, agaptation)  Channel  Channel	Project #	# Project Name				Cowardin			SAR#			
Studentik, M. Rockwell	N/A	DC2	2RVA - Segme	ent 3	VA		02070010	10/29/15		iongai	, dotto	
Optimal   Suboptimal   Channel Condition: Assess the cross-section of the stream and prevailing condition (Particular Application Condition   Channel Condition   Ch	Name				e and Informa	ation	L		l			
Optimal Suboptimal Marginal Poor Severe    Subject   Suboptimal Subject   Sub	J. Bu	dnik, M. Roc	kwell				02-S7	ΓR-21				
Channel Condition Channel Condition Channel Condition Channel Condition Channel Condition Channel Condition Conditio	. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
Condition   Very liftle inclaim or active encount, possible process of active   Vertically little production   Vertically little production   Vertically   Vert		Opt	imal	Subo				Po	or	Sev	ere	
Channel Condition Wey filte lecizione or active enougo; polytos stable banks. Veylepsith of control of the cont		1	W.	1		~		Overwiden	ed/incised.	1	5	
ANDOR V-shaped character hore system bottom.  Score 3 2.4 2 1.6 1  NOTES>> Banks are severely incised. Evidence of bank erosion. Field Sheet: 03-C-STR-08.  Separation of the stream of the stream bottom.  Suboptimal Suboptimal High Suboptimal With the stratum (sch - 3 scheda) present with the stratum (sch - 3 scheda) present. High Suboptimal With the stratum (sch - 3 scheda) present with the stratum (sch - 3 scheda) present. High Suboptimal With the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present with the stratum (sch - 3 scheda) present. Socre with the stratum (sch - 3 scheda) present with schoda present		100% stable ba surface protectio prominent (80-1 Stable point barsa are present. Acca floodplain or fully bankfull benches. and transverse ba	on or active erosion; 80- ib anks. Vegetative corbon or natural rock, i0-100%). AND/OR ars/bankfull benches ccess to their original fully developed wide as. Mid-channel bars, benefits. Tracings.			Poor. Banks more stable than Severe to ror Poor due to lower bank slopes. Erosion may be present on 40-60% of banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute temporary/transient, contribute to possible that contribute to possible that contribute to possible that contribute to provide the provided that the possible that the		a Vertically/laterally unstable. Likely to widen further. Majority of both banks of are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in o nature, and contributing to instability.		Deepy included to exclavate of the control of the c		
Riparian   Buffers   Conditional Category					sediment covers 10-40% of the		AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which		40% of the banks and stable		bed is covered by uting to instability. channels and/or	c
Conditional Category  Optimal Suboptimal  High Suboptimal: Riparian areas  Figure to statum (bb - 3 inches) superpose and located within the riparian areas.  Well subject or a reason of the research of the	Score	;	3	2	.4	:	2	1.	6	1		1.
Riparian Buffers  Riparian Buffers  Riparian areas.  Ripa				Conditional Category Suboptimal Marginal			ginal	Poor		NOTES>> Some		
Condition Scores  1.5 1.2 1.1 0.85 0.75 0.6 0.5  1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below. 3. Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank  % Riparian Area> 50% 25% 25% 100% Score> 0.75 0.6 0.5  Left Bank  % Riparian Area> 50% 25% 25% 100% Score> 0.75 0.6 0.5  Left Bank  100% Rt Bank CI> 0.65 Score> 0.75 0.6 0.5  1. Lt Bank CI> 0.65 Score> 0.75 0.6 0.5  3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; undercut banks; root mats; SAV; riffle poole complexes, stable features.  Conditional Category Habitat/ Available Toyer Instream Habitat/ Available Toyer Ingreter than 50% of the reach. In greater than 50% of the reach and are adequate for maintenance of in greater than 50% of the reach.		with > 60% tree connon-maintained un	anopy cover and a derstory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Non-maintained, dense herbacous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  3. Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank  % Riparian Area> 50% 25% 25% Score > 0.75 0.6 0.5  Left Bank  Left Bank  % Riparian Area> 50% 25% 25% Score > 0.75 0.6 0.5  Left Bank  100%  Rt Bank CI > 0.65  Lt Bank CI > 0.65  Lt Bank CI > 0.65  Instream Habitat/ Available Cover  Optimal  Suboptimal  Marginal  Marginal  Marginal  Poor  Habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of a for for formatic for formatic formatic formatic formatic format	0 150			High	Low	High	Low	High	Low			
descriptors.  2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  3. Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank  % Riparian Area> 50% 25% 25% 100%  Score > 0.75 0.6 0.5  Left Bank  We Riparian Area> 50% 25% 25% 100%  Score > 0.75 0.6 0.5  Left Bank  100%  Rt Bank CI > 0.65  Lt Bank CI > 0.65  Score > 0.75 0.6 0.5  Score > 0.75 0.6 0		1	.5	1.2	1.1	0.85	0.75	0.6	0.5			
Score   Scor	· · · · · · · · · · · · · · · · · · ·	uare footage for each by measuring or estimating length and width.		ngth and width. (	Calculators are provided for you		of % Riparian					
Cl= (Sum % RA * Scores*0.01)/2	escriptors.  Determine sq elow.								100%			
Score > 0.75 0.6 0.5 Lt Bank Cl > 0.65  3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle poole complexes, stable features.    Instream   Optimal   Suboptimal   Marginal   Poor     Habitat elements are typically present in 90-90% of the reach and are adequate for maintenance of are adeq	escriptors.  Determine sq elow. Enter the % F	Riparian Area and % Riparian Area>	50%	25%					10070			
Score > 0.75 0.6 0.5  ILt Bank Cl > 0.65  S. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle poole complexes, stable features.  Conditional Category  Optimal Suboptimal Marginal Poor  Habitat/ Available Cover  Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of are a	escriptors.  Determine sq elow. Enter the % F	Riparian Area and % Riparian Area>	50%	25%					10070	CI= (Sum % RA * S	cores*0.01)/2	
Instream Habitat/ Available Cover Habitat elements are typically present in greater than 50% of the reach.  Ingreder than 50% of the reach.  Instream Habitat elements are typically present in greater than 50% of the reach.  Instream Habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of elements are typically present in less	escriptors. Determine sq elow. Enter the % F	Riparian Area and % Riparian Area> Score > % Riparian Area>	50% 0.75 50%	25% 0.6 25%	0.5 25%					Rt Bank CI >	0.65	С
Instream Habitat/ Available Cover Habitat elements are typically present in greater than 50% of the reach.  Cover	escriptors. Determine squelow. Enter the % F Right Bank Left Bank	Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >	50% 0.75 50% 0.75	25% 0.6 25% 0.6	0.5 25% 0.5				100%	Rt Bank CI >	0.65	C 0.6
Habitat/ Available Cover Habitat elements are typically present in 30-50% of the reach and in greater than 50% of the reach.  Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of are adequate for maintenance of elements are typically present in less	escriptors. Determine squelow. Enter the % R Right Bank Left Bank B. INSTREAM	Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: V.	50% 0.75 50% 0.75 aried substrate si	25% 0.6 25% 0.6 zes, water velocit	0.5 25% 0.5 y and depths; wo	ody and leafy dek	oris; stable substr	ate; low embeded	100%	Rt Bank CI >	0.65	
Available Habitat elements are typically present present in 30-50% of the reach and in greater than 50% of the reach. are adequate for maintenance of are adequate for a	escriptors. Determine squelow. Enter the % F Right Bank Left Bank Linstream	Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: V. root mats; SAV; r	50% 0.75 50% 0.75 aried substrate si iffle poole comple	25% 0.6 25% 0.6 zes, water velocitieses, stable feature.	0.5 25% 0.5 ty and depths; wo res. Conditiona	l Category			100%	Rt Bank CI >	0.65	
populations social than 400/ of the reach	escriptors. Determine squelow. Enter the % F Right Bank  Left Bank  Left Bank  Instream Habitat/	Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: V. root mats; SAV; r	50% 0.75 50% 0.75 aried substrate si iffle poole completimal	25% 0.6 25% 0.6 2s, water velociexes, stable featu Subo Stable habitat ele	0.5 25% 0.5 ty and depths; wo res. Conditionaptimal ments are typically	I Category  Mare  Stable habitat ele	ginal ments are typically	Po Habitat elements	100% Iness; shade; or	Rt Bank CI >	0.65	
populations.         populations.         than 10% of the reach.           Score         1.5         1.2         0.9         0.5	escriptors. Determine squelow. Enter the % F Right Bank  Left Bank  B. INSTREAM Indercut banks; Instream Habitat/ Available	Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: W root mats; SAV; r  Opt  Habitat elements a	50% 0.75 50% 0.75 aried substrate si iffle poole completimal	25% 0.6 25% 0.6 zes, water velocitieses, stable featu Subo Stable habitat ele present in 30-509 are adequate fo	25% 0.5 y and depths; wo res. Conditionaptimal ments are typically 6 of the reach and	Stable habitat ele present in 10-30% are adequate fo	ginal ments are typically 6 of the reach and r maintenance of	Po Habitat elements lacking or are ui elements are typic	100% Iness; shade;  Or listed above are stable. Habitat ally present in less	Rt Bank CI > Lt Bank CI >	0.65	

Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	csx		VA	R4SB3	02070010	10/29/2015	02-STR-21		
	ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, conc		concrete blocks,	straightening of ch	hannel, channeliz	ation,	NOTES>> C	•
	Negligible Mi		nor	<u> </u>		Severe		stream.	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5		
	DEACH	ONDITION I	IDEVI C	TDE AM COL	IDITION UN	ITC FOR TH	IC DEACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF





Top Left: Typical view of stream away from the railroad

Top Right: View of culvert carrying stream under

railroad

Bottom LeftL View upstream toward construction

NC DWQ Stream Identification Form Version 4.11

A. Geomorphology (Subtotal = 8.5

02-STR-21

Strong

Date: 10/29/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.744203
Evaluator: J. Budnik, M. Rockwell	County: Fairfax	Longitude: -77.183643
<b>Total Points:</b> 20.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

Absent

Weak

Moderate

				•
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	(N	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 3				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5)	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	= 3
C. Biology (Subtotal = 9				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other = 0	
	•			

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream crosses access road path. Stream has eroded section of road that it crosses, so banks are incised. Feeds into culvert. Field Sheet:

Sketch:

		Stre				Form	) (For	m 1)			
						is intermittent or					
Project #		Project Name	)	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2	RVA - Segme	ent 3	VA	R4SB3	02070010	10/29/15				
	e(s) of Evalua	. ,	Stream Nam	e and Informa	ation				•		
J. Bu	dnik, M. Roc	kwell				02-S	ΓR-22				
I. Channel C	ondition: Asse	ess the cross-sec	tion of the stream								
	Opti	mal	Subo	ptimal c	onditional Catego	ginal	Po	or	Sev	ere	
	13	Who have	1		Often incised, but I	less than Severe or	Overwiden	ed/incised.	1	5	
Channel Condition	Very little incision o 100% stable bai surface protectio prominent (80-1 Stable point bars' are present. Acce floodplain or fully bankfull benches. and transverse basediment depositio	n or natural rock, 00%). AND/OR bankfull benches as to their original developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60-Depositional feat stability. The bar channels are wellikely has access to or newly develope portions of the r	ew areas of active cted banks. Majority table (60-80%). titon or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient	Poor. Banks more or Poor due to Ic Erosion may be pr both banks. Vegel 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositis stability, may be	stable than Severe ower bank slopes. resent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sisient, contribute on that contribute to forming/present.	Vertically/laterally widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/Of stream is covere Sediment is temp nature, and contrit AND/OR V-shapp	unstable. Likely to ority of both banks Frosion present on ks. Vegetative nt on 20-40% of ffficient to prevent R 60-80% of the ed by sediment. orary/transient in outing to instability. ed channels have	Deeply incised vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/undero protection present o banks, is not pre Obvious bank slice Erosion/raw ban AND/OR Aggradin,	stability. Severe tained within the do below average tajority of banks ut. Vegetative in less than 20% of venting erosion. Dughing present. ks on 80-100%.	
	10% of			rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depos	nks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	uting to instability. channels and/or	С
Score	3	3	2	.4		2	1.	.6	1		2.0
NOTES>> 2. RIPARIAN	I BUFFERS: A	Assess both bank	•	an areas along the	e entire SAR. (ro	03-C-STR-0		- th may be accep	•		
	Opti	imal		ditional Categorial Categorial Categorial Categorial Categorian Ca		ginal	Po	or	NOTES>> B of the stream		
Riparian Buffers	Tree stratum (dbh :	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	gravel and r of the stream to be flowin pipe. Stream directed tow culvert.	ip rap. Part m appears g through a n is	
			High	Low	High	Low	High	Low			
Condition Scores	1.	5	1.2	1.1	0.85	0.75	0.6	0.5			
I. Delineate ripa descriptors. 2. Determine squelow. 3. Enter the % F	rian areas along uare footage for e Riparian Area and % Riparian Area>	ach by measurin	g or estimating le	ngth and width. (	Calculators are pr		Ensure to	iparian			
Right Bank	Score >	0.5									
Left Bank	% Riparian Area>	100%						100%	CI= (Sum % RA * S Rt Bank CI >	0.50	CI
	Score >	0.5							Lt Bank CI >	0.50	0.5
	/I HABITAT: Va					bris; stable substr	ate; low embeded	Iness; shade;	NOTES>> gravel. Stre	am is	
Instream Habitat/	Opti	mal	Subo	ptimal		ginal	Po		crossed by road.	access	
iiabildl	Hahitat elements a	re typically present		ments are typically % of the reach and	present in 10-30%	ments are typically % of the reach and	Habitat elements lacking or are ur		oud.		
Available Cover	in greater than 5			r maintenance of		or maintenance of	elements are typic	ally present in less		-	С
Available		0% of the reach.	popul	r maintenance of lations.	popul	or maintenance of lations.	elements are typics than 10% o	f the reach.	-		0

	St	ream In	npact A	ssessm	ent For	rm Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB3	02070010	10/29/2015	02-STR-22		
	_ ALTERATION: Stream cross poil piles, constrictions, livestock		Conditiona	l Category				NOTES>> C altered due presence of	to
	Negligible	Mir	nor		erate 60 - 80% of reach	Sev	ere	road and di	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter DR 80% of banks bion, riprap, or	stream towa via riprap m pipe.	
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5		

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:





Top Left: View of culvert under railroad
Top Right: View of construction along stream
Bottom Left: View of wetland vegetation in stream
away from railroad

NC DWQ Stream Identification Form Version 4.11

02-STR-22

Date: 10/29/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.743081
Evaluator: J. Budnik, M. Rockwell	County: Fairfax	Longitude: -77.189039
<b>Total Points:</b> 25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 8)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $7.5$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes	= 3
C. Biology (Subtotal = $9.5$				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	<u> </u>	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Atypical situation due to disturbance in the eastern portion and large rain even on 10/28/15. Stream also has been channelized with a pipe and riprap present to direct flow. Culvert receives stream flow. Field Sheet: 03-C-STR-07

Sketch:

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral strea Impact/SAR Cowardin Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor DC2RVA - Segment 3 02070010 10/28/15 Name(s) of Evaluator(s) Stream Name and Information J. Budnik, M. Rockwell 02-STR-23 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Riparian Marginal Optimal Suboptimal buffer is a mixture of rip rap and invasive plants. High Poor: Lawns, mowed, and maintained areas, nurseries no-till cropland; actively grazed pasture, sparsely vegetated normaintained area, recently seeded and stabilized, or other comparable condition. Low Marginal: Low Suboptimal Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canop; cover and a maintained understory. Recent cutover (dense vegetation). Field Sheet: 03-C-STR-High Marginal: Non-maintained, dense herbaceou: vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover. High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory. Low Poor: Impervious surfaces, mine spoil lands, enuded surfaces row crops, active eed lots, trails, or other comparable conditions. Free stratum (dbh > 3 inches) p with > 60% tree canopy cover a non-maintained understory. We Riparian Buffers High Low High High Condition 0.85 0.75 0.6 0.5 1.5 1.2 1.1 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian parian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% % Riparian Area: Right Bank 0.6 CI= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> 100% Rt Bank CI > 0.60 CI Left Bank 0.60 0.6 Lt Bank CI > 0.60 Score > REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.30 IOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to 2 decimal places. RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF INSERT PHOTOS: Top Left: View upstream of culvert under

Top Left: View upstream of culvert under railroad

Top Right: View upstream of culvert under railroad and ballast

Bottom Left: View downstream away from culvert

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 10/28/2015

02-STR-23

Evaluator: J. Budnik, M. Rockwell	County: Fairfax		Longitude: -77	'.187172
<b>Total Points:</b> 15.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	
A. Coornormholomy (O. Lystel, 7	Absent	Weak	Moderate	Ctrong
A. Geomorphology (Subtotal = 7		vveak		Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	<u>2</u> 2	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches		1	2	3
7. Recent alluvial deposits		1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	<u> </u>	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	_	0 = 0	Yes:	
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $\frac{2}{2}$ )				
12. Presence of Baseflow	0	1)	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes :	= 3
C. Biology (Subtotal = 6.5				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	$\triangleright$
*perennial streams may also be identified using other methodology. Stream exists between two culverts. Banks have rouverts. Field Sheet: 03-C-STR-06	nods. See p. 35 of manua ip rap material. Stream su	l.		
Sketch: Piplat Riplat Calle	974			

		Stre		SSESS			-	m 1)			
Dunis -+ 4		Project Name		wadeable chan	nels classified a	s intermittent or		CAD#	Impact/SAR	Impact	
Project #		•		Locality	Class.		Date	SAR #	length	Factor	
N/A Nam	e(s) of Evaluat	RVA - Segme		VA e and Informa	R4SB2	02070010	10/28/15				
	dnik, M. Roc	. ,	Stream Nam	e and imornic		02-S	ΓR-24				
. Channel C	Condition: Asse	ss the cross-sec	tion of the stream	and prevailing co	ondition (erosion.						
	Optimal				onditional Catego		Poor		Severe		
	У	IIIai	Jubo	ptimai	Iviai	giriai	W.		Jev	//	
	The state of the s	MAR		<u>s</u>		less than Severe or stable than Severe	Overwiden		1	5	
Channel Condition		nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars,	erosion or unproted of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR cures contribute to akfull and low flow II defined. Stream o bankfull benches, d floodfulains along.	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran	swer bank slopes. esent on 40-60% of lative protection on Streambanks may rcut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Majority of both banks		roting depth, rovertical/underc banks. Streamber rooting depth, rovertical/underc protection present of banks, is not pre Obvious bank sk	stability. Severe natained within the ad below average najority of banks tut. Vegetative on less than 20% of eventing erosion. pughing present.	
	bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.		each. Transient s 10-40% of the	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the onal features which to stability.	AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable				c	
Score	3			.4	2			1.6 nt in stream bed.		ı	2.
. RIPARIAI	N BUFFERS: A	Assess both bank		an areas along the		ugh measuremen	ts of length & wid	th may be accep	ntable)		
	Opti	mal		ptimal		ginal	Po	or			
Riparian Buffers	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the	nopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
			High	Low	High	understory.	High	Low			
Condition Scores	1.	5	High 1.2	Low 1.1	High 0.85	understory.	High 0.6	Low 0.5			
Scores  Delineate ripolescriptors. Determine scoelow.	1. arian areas along of quare footage for e	each stream ban	1.2 k into Condition C	1.1 Categories and Co	0.85 Indition Scores us	Low 0.75	0.6 Ensure t	0.5 he sums			
Scores  Delineate ripolescriptors. Determine scorelow.	arian areas along of quare footage for e Riparian Area and % Riparian Area>	each stream ban ach by measurin Score for each ri 100%	1.2 k into Condition C	1.1 Categories and Co	0.85 Indition Scores us	Low 0.75	0.6  Ensure t	0.5 he sums			
Scores  Delineate ripidescriptors. Determine scielow. Enter the % I	arian areas along e quare footage for e Riparian Area and	each stream ban ach by measurin Score for each ri	1.2 k into Condition C	1.1 Categories and Co	0.85 Indition Scores us	Low 0.75	0.6  Ensure t	0.5 he sums liparian qual 100	Cl≕ (Sum % RA * S	cores*0.01)/2	
Scores  Delineate rip: escriptors. Determine scelow. Enter the % I	arian areas along of quare footage for e Riparian Area and % Riparian Area>	each stream ban ach by measurin Score for each ri 100%	1.2 k into Condition C	1.1 Categories and Co	0.85 Indition Scores us	Low 0.75	0.6  Ensure t	0.5 he sums liparian qual 100	C⊫ (Sum % RA * S Rt Bank Cl >	cores*0.01)/2	C
Scores  Delineate ripidescriptors. Determine scielow. Enter the % I Right Bank  Left Bank	arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >	each stream ban ach by measurin Score for each ri 100% 0.85	tinto Condition C g or estimating le parian category in	1.1 Categories and Co	0.85 Indition Scores us Calculators are prov.	Low 0.75 sing the ovided for you	O.6  Ensure t  of % R  Blocks e	0.5 he sums liparian qual 100 100%	Rt Bank CI >		
Scores  Delineate ripidescriptors. Determine scoledw. Enter the % I Right Bank  Left Bank  INSTREAI	arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >	ach stream ban ach by measurin Score for each ri 100% 0.85 100% 0.85 aried substrate si	tinto Condition C g or estimating le parian category in	1.1 Categories and Coungth and width. Coungth and w	0.85  Indition Scores us Calculators are prov.	Low 0.75 sing the ovided for you	O.6  Ensure t  of % R  Blocks e	0.5 he sums liparian qual 100 100%	Rt Bank CI >	0.85	
Scores  Delineate ripidescriptors. Determine scielow. Enter the % I Right Bank  Left Bank  B. INSTREAI undercut banks; Instream	guare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Varroot mats; SAV; ri	ach stream ban ach by measurin Score for each ri 100% 0.85  100% 0.85  aried substrate si	tinto Condition C g or estimating le parian category in zes, water velocit	1.1 Sategories and Congth and width. Congth and width. Congth the blocks below by and depths; wo res. Conditiona	0.85 Indition Scores us Calculators are prov.  ody and leafy det	understory. Low 0.75 sing the ovided for you  pris; stable substr	O.6  Ensure t of % R Blocks e	0.5 he sums hiparian qual 100 100% 100%	Rt Bank CI >	0.85	
Scores  Delineate ripidescriptors. Determine scietow. Between the work of the	guare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  % Riparian Area> root mats; SAV; ri  Opti Habitat elements ai	ach stream ban ach by measurin Score for each ri 100% 0.85 100% 0.85 aried substrate si ffle poole comple	tinto Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	1.1 sategories and Congth and width. Congth and width. Congth and depths; wo res. Conditional ptimal ments are typically 6 of the reach and	0.85 Indition Scores us Calculators are prov.  ody and leafy detail Category  Mar  Stable hadron 10-309	understory. Low 0.75  sing the ovided for you  pris; stable substructions are typically 6 of the reach and	of % R Blocks e  ate; low embeded  Habitat elements lacking or are un	0.5  he sums  liparian qual 100  100%  100%  Iness; shade;	Rt Bank CI > Lt Bank CI >	0.85	3.0
Scores  Delineate ripidescriptors. Determine scoledw. Enter the % I Right Bank  Left Bank  Left Bank  Instream Habitat/	arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Varoot mats; SAV; ri	ach stream ban ach by measurin Score for each ri 100% 0.85 100% 0.85 aried substrate si ffle poole comple mal re typically present 0% of the reach.	tinto Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	1.1 Sategories and Congth and width. Cong	0.85 Indition Scores us Calculators are prov.  Ody and leafy det Il Category  Mar  Stable habitat ele present in 10-309 are adequate fo popul	understory. Low 0.75  sing the ovided for you  oris; stable substr	D.6  Ensure to of % Reserved R	0.5 he sums lipanian qual 100 100% 100% liness; shade;	Rt Bank CI > Lt Bank CI >	0.85	C 0.8

	St	ream In	npact A	ssessm	ent Fo	rm Pag	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB2	02070010	10/28/15	02-STR-24		
	ALTERATION: Stream cross spoil piles, constrictions, livestock Negligible			al Category	straightening of cl		ration,	NOTES>> State of the contract	ween two is large
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	80% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or	rocks/bould	lers.
	1.5	1.3	1.1	0.9	0.7	0	-	1	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



View upstream of culvert under railroad

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 10/28/2015

02-STR-24

	County: Fairfax		Longitude: -77.187094		
<b>Total Points:</b> 22 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal = 12 )	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	(1)	2	3	
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1)	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
3. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	No	0 = 0	Yes :	= 3	
artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = 2.5					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	(0.5)	0	
15. Sediment on plants or debris	0	0.5)	1	1.5	
16. Organic debris lines or piles	0	0.5)	1	1.5	
17. Soil-based evidence of high water table?	No	0 = 0	Yes =	= 3	
C. Biology (Subtotal = 7.5					
18. Fibrous roots in streambed	3	2	1	0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	(0)	0.5	1	1.5	
23. Crayfish	(0)	0.5	1	1.5	
24. Amphibians	0	(0.5)	1	1.5	
25. Algae	(0)	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0		
*perennial streams may also be identified using other method	s. See p. 35 of manua	al.			
	th railroad berm and c	ulvert associated with of	fice park. It was scor	red after a heav	
Notes: Stream channel exists between culvert associated wit rainstorm, the flow is likely much lower than what was		arron accountated min on	•		

			m 1)	jinia	or use in Virg						
	Impact Factor	Impact/SAR length	SAR#	perennial Date	HUC	nels classified as Cowardin Class.	Locality		Project Name		Project #
•	i dotoi	iongui		10/26/2015	02070010	R2UB	VA	ent 3	2RVA - Segme	DC2	N/A
						ntion	e and Informa			e(s) of Evalua	Name
			Creek)	Accotink (	ΓR-25 (A	02-S			ckwell	dnik, M. Roc	J. Bu
								tion of the stream	ess the cross-sec	ondition: Asse	. Channel C
	ere	Seve	or	Po		onditional Categor	ptimal	Subo	timal	Opt	
	5			Overwidene		Often incised, but le	6	***	Le Mark	17	
ere the age ks e 0% of on. ent.	stability. Severe tained within the d below average ajority of banks ut. Vegetative in less than 20% oventing erosion. hughing present. ks on 80-100%.	Deeply incised ( vertical/lateral ins incision, flow cont banks. Streamber rooting depth, ma vertical/undercu protection present or banks, is not prev. Obvious bank slot Erosion/raw bank	prity of both banks irosion present on ks. Vegetative and on 20-40% of fficient to prevent R 60-80% of the do by sediment. orary/transient in puting to instability.	Vertically/laterally L widen further. Maj are near vertical. E 60-80% of bank protection preser banks, and is insul erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	esent on 40-60% of ative protection on Streambanks may rcut. AND/OR 40- is covered by liment may be sient, contribute on that contribute to	or Poor due to lov	tion or natural rock	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The ban channels are wel likely has access to or newly develope:	or active erosion; 80- anks. Vegetative on or natural rock, 100%). AND/OR s/bankfull benches ess to their original y developed wide . Mid-channel bars, lars few. Transient	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or full) bankfull benches. and transverse ba	Channel Condition
ed by oility.	bed is covered by uting to instability. channels and/or	AND/OR Aggrading than 80% of stream deposition, contribu Multiple thread of subterrane	on is present on > nks and stable	vegetative protection 40% of the band sediment depos	ed channels have on on > 40% of the onal features which	AND/OR V-shape vegetative protection banks and deposition contribute	s 10-40% of the bottom.	sediment cover	on covers less than bottom.		
		1	6	1.	2	2	.4	2	3	;	Score
<b>1</b>	Southern-	table)	h may be accept	incised. Fie		entire SAR. (rou	ın areas along the	's 100 foot riparia		I BUFFERS: /	NOTES>> 2. RIPARIAN
as	tream was stream p to cross; layer m nd		Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	Por High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.		High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.		c's 100 foot riparia		Opti Tree stratum (dbh : with > 60% tree c. non-maintained un	
as	tream was stream p to cross; layer m nd	NOTES>> S portion of st surveyed as was too dee herbaceous contains Microstegiun vimineum al	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	Por High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	igh measurement  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  LOW	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	un areas along the ditional Categotimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Con- Subol High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	Assess both bank timal  > 3 inches) present, anopy cover and a derstory. Wetlands ne riparian areas.	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	2. RIPARIAN Riparian Buffers
as	tream was stream p to cross; layer m nd	NOTES>> S portion of st surveyed as was too dee herbaceous contains Microstegiun vimineum al	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	Por High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	igh measurement  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Con- Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Assess both bank timal  > 3 inches) present, anopy cover and a deerstory. Wetlands	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	2. RIPARIAN
as	tream was stream p to cross; layer m nd	NOTES>> S portion of st surveyed as was too dee herbaceous contains Microstegiun vimineum al	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	Por High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	igh measurement  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree stratum (dbh >3 inches) present. with <30% tree canopy cover with maintained understory.  Low  0.75	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  attegories and Co	Con- Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C	Assess both bank timal  > 3 inches) present, anopy cover and a derstory. Wetlands ne riparian areas.	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1.  arian areas along uare footage for e	Riparian Buffers  Condition Scores  1. Delineate ripa descriptors. 2. Determine squelow.
as	tream was stream p to cross; layer m nd	NOTES>> S portion of st surveyed as was too dee herbaceous contains Microstegiun vimineum al	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr of % Ri	igh measurement  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree stratum (dbh >3 inches) present. with <30% tree canopy cover with maintained understory.  Low  0.75	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  attegories and Co	Con- Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating ler parian category in  50%	Assess both bank timal  > 3 inches) present, anopy cover and a aderstory. Wetlands he riparian areas.  .5  each stream ban each by measurin 3 Score for each ri 50%	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1.  arian areas along uare footage for e	Riparian Buffers  Condition Scores  1. Delineate ripa descriptors. 2. Determine squelow.
as ss;	tream was stream p to cross; layer m nd keisak.	NOTES>> S portion of st surveyed as was too dee herbaceous contains Microstegiun vimineum an Murdannia k	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums iparian qual 100  100%	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr of % Ri	igh measurement  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree stratum (dbh >3 inches) present. with <30% tree canopy cover with maintained understory.  Low  0.75	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  attegories and Co	Con- Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  K into Condition C g or estimating let parian category in 50%  1.1	Assess both bank timal  > 3 inches) present, tanopy cover and a derstory. Wetlands he riparian areas.  .5  each stream ban each by measurin d Score for each ri 50% 0.85	Tree stratum (dbh: with > 60% tree ct non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area>	Riparian Buffers  Condition Scores I. Delineate ripa descriptors. 2. Determine squelow. 3. Enter the % F
as ss;	tream was stream properties of the stream of	NOTES>> S portion of st surveyed as was too dee herbaceous contains Microstegiui vimineum ai Murdannia k	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr of % Ri	igh measurement  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree stratum (dbh >3 inches) present. with <30% tree canopy cover with maintained understory.  Low  0.75	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  attegories and Co	Con- Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  K into Condition C g or estimating let parian category in 50%  1.1	Assess both bank timal  > 3 inches) present, tanopy cover and a derstory. Wetlands he riparian areas.  .5  each stream ban each by measurin d Score for each ri 50% 0.85	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1.  trian areas along uare footage for ec Riparian Area and % Riparian Area>  Score >	Riparian Buffers  Condition Scores I. Delineate ripa descriptors. 2. Determine squelow. 3. Enter the % F
as ss;	tream was stream p to cross; layer m nd keisak.	NOTES>> S portion of st surveyed as was too dee herbaceous contains Microstegiun vimineum an Murdannia k	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Description 100%  100%  100%  100%	Its of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks ee the seeded and stabilized of th	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  ing the povided for you	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with < 30% tree canopy cover.  High  0.85 Indition Scores us calculators are produced to the produced by the canopy cover.	un areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Congth and width. Con the blocks below y and depths; wores.  Conditiona primal ments are typically	Con- Subop  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Kinto Condition C g or estimating ler parian category in 50%  1.1  50%  0.85  zes, water velocit exes, stable feature.	Assess both bank  timal  > 3 inches) present, tanopy cover and a derstory. Wetlands he riparian areas.  .5  each stream ban each by measurin 50% 0.85  50% 1.1  faried substrate si riffle poole complettimal	Tree stratum (dbh: with > 60% tree co non-maintained un located within th located within th  arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  M HABITAT: Viroot mats; SAV; r	Condition Scores  Delineate ripa Descriptors. Deltermine squelow. Below.
as ss;	tream was stream properties of the stream of	NOTES>> S portion of st surveyed as was too dee herbaceous contains Microstegiui vimineum ai Murdannia k  Cl= (Sum % RA * Sc Rt Bank Cl > Lt Bank Cl >	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks educate; low embeded	igh measurement  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree stratum (dbh >3 inches) present, tree stratum (dbh >3 inches) present. With <30% tree canopy cover with maintained understory.  Low  0.75  Ing the povided for you  ris; stable substrating in the subs	High Marginal: Non-maintained, dense herbaceous vegetation with elayer of a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85 Indition Scores us calculators are produced to the canopy cover.	un areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Congth and width. Con the blocks below y and depths; wores.  Conditiona primal ments are typically	Con- Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  K into Condition C g or estimating let parian category in 50%  1.1  50%  0.85  zes, water velocit exes, stable featur  Subop  Stable habitat eler present in 30-50% are adequate for area and area.	Assess both bank timal  > 3 inches) present, anopy cover and a adderstory. Wetlands he riparian areas.  .5  each stream ban each by measurin 50% 0.85  50% 1.1  Varied substrate siriffle poole complete	Tree stratum (dbh: with > 60% tree cr. non-maintained un located within the located withi	Condition Scores  1. Delineate ripa descriptors. 2. Determine squelow. 3. Enter the % R Right Bank  Left Bank  3. INSTREAN undercut banks; Instream

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	csx	VA	R2UB	02070010	10/26/2015	02-STR-25			
	ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, conc		concrete blocks, s	straightening of ch	hannel, channeliz	ation,	NOTES>> R bridge pres	
	Negligible	Mir	nor	Mode	erate	Sev	ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5		
	REACH C	ONDITION II	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.16

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Typical view of stream away from railroad Top Right: View upstream of railroad crossing over creek with I-95 crossing in the background Bottom Left: Typical view of stream away from

railroad

NC DWQ Stream Identification Form Version 4.11 Accotink Creek 02-STR-25

Date: 10/26/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.722614
Evaluator: J. Budnik, M. Rockwell	County: Fairfax	Longitude: -77.204156
<b>Total Points:</b> 42.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennia	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 21)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No	o = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual			_	
B. Hydrology (Subtotal = 6.5				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	(1.5)
16. Organic debris lines or piles	0	0.5	1	(1.5)
17. Soil-based evidence of high water table?	(No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 15	_			
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	(1)	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method				
Notes: Accotink Stream. Surveying area sout	th of steep banks. I	Incised banks o	on southern side.	
Field Sheet: 03-C-STR-01				

		Stre					(For	m 1)			
				fied Stream N wadeable chan			•				
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2	RVA - Segme	ent 3	VA	R4SB	02070010	10-27-2015				
Name	e(s) of Evaluat	or(s)	Stream Nam	e and Informa	ation						
J. Bu	dnik, M. Roc	kwell				02-S	ΓR-26				
. Channel C	ondition: Asse	ss the cross-sec	ction of the stream		ondition (erosion,						
	Opti	mal	Subo	ptimal		ginal	Po	or	Sev	/ere	
	7	NAME OF THE PROPERTY OF THE PR	V	No.		less than Severe or	Overwiden		1	5	
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-10 Stable point bars/t are present. Acces floodplain or fully bankfull benches.	ks. Vegetative or natural rock, 10%). AND/OR bankfull benches as to their original developed wide Mid-channel bars,	erosion or unproted of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to	ew areas of active cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR cures contribute to hkfull and low flow III defined. Stream o bankfull benches, d floodplains along	or Poor due to lo Erosion may be pro both banks. Veget 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the by sediment. orary/transient in	vertical/lateral in incision, flow cor banks. Streambrooting depth, n vertical/underc protection present obanks, is not pre Obvious bank sl	(or excavated), istability. Severe natained within the ed below average najority of banks cut. Vegetative on less than 20% of eventing erosion. oughing present. iks on 80-100%.	
	and transverse ba sediment deposition 10% of b	covers less than	portions of the r sediment cover	each. Transient s 10-40% of the bottom.	stability, may be AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the onal features which to stability.	AND/OR V-shape vegetative protecti 40% of the bar	ed channels have on is present on > iks and stable	AND/OR Aggradin than 80% of stream deposition, contrib Multiple thread	g channel. Greater n bed is covered by buting to instability. channels and/or nean flow.	CI
Score	3		2	.4	:	2	1.	6	•	1	1.0
. RIPARIAN	BUFFERS: A	ssess both bank		an areas along the		ugh measuremen	ts of length & wid	h may be accep	ntable)	anks are	
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or	concrete lin	,	
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	nopy cover and a erstory. Wetlands	to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		•	
			High	Low	High	Low	High	Low			
Condition Scores	1.5	5	1.2	1.1	0.85	0.75	0.6	0.5			
escriptors.  Determine squelow.  Enter the % R	arian areas along e uare footage for ea Riparian Area and S % Riparian Area>	ach by measurin	g or estimating le	ngth and width. (	Calculators are pr	-	Ensure to	iparian			
Right Bank	Score >	0.85						. 00 /0			
_ <del>_</del> _	% Piparion Area	75%	25%					100%	CI= (Sum % RA * S Rt Bank CI >	cores*0.01)/2 0.85	CI
Left Bank	% Riparian Area>	0.85	1.5					100%	Lt Bank CI >	1.01	0.93
	/ UADITAT. V-	riad substrata si			ody and leafy deb	oris; stable substr	ate; low embeded	ness; shade;		is bordered	
indercut banks;	root mats; SAV; rit			res. Conditiona	I Category				by wetlands	s on its	
Instream		fle poole comple	exes, stable featu	Conditiona ptimal	Mar	ginal	Po		banks.	s on its	
indercut banks;	root mats; SAV; rit	mal e typically present	Subo Stable habitat ele present in 30-50% are adequate fo	Conditiona	Stable habitat ele present in 10-30% are adequate fo	ginal ments are typically 6 of the reach and r maintenance of ations.	Po Habitat elements lacking or are ur elements are typic than 10% o	listed above are estable. Habitat ally present in less		s on its	CI

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point Project # Date SAR length Impact Factor R4SB 02070010 10-27-2015 02-STR-26 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Channelized Conditional Category Moderate Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not cement. guidelines. guidelines. recovered. recovered. SCORE 1.5 1.3 1.1 0.9 0.7 0.5 0.50

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Typical View of stream Bottom Right: Typical view of stream along railroad

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 10/27/2015

02-STR-26

Evaluator: J. Budnik, M. Rockwell	County: Fairfax		Longitude: -77	.210819
<b>Total Points:</b> 24 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = $13.5$ )	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	1)	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	1)	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 6.5				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	0	0.5	1	(1.5)
16. Organic debris lines or piles	0	0.5	1	(1.5)
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	=3)
C. Biology (Subtotal = 4				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks		1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	>
*perennial streams may also be identified using other met	-		ad with aulyorta	under beth the
Notes: Stream is channelized with concrete em				
railroad and I-95. Sediment has been de	eposited in parts of ti	ne stream. Field sne	et: 03-C-STR-0	3
stream7 Concrete lined che	innel)			
41				

		Stre					(For	m 1)			
				fied Stream N wadeable chan							
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		RVA - Segme		VA	R4SB	02070010	10/27/15				
	ne(s) of Evaluat	. ,	Stream Nam	e and Informa	ation	00.07	FD 07				
	udnik, M. Roc Condition: Asse		tion of the atroom	and provailing o	andition (areaisn		TR-27				
. Channel C				C	Conditional Catego	ry			0		
	Opti	mai	Subo	ptimal	Iviar	ginal	Po	or	Sev	rere	
	" Lake	ALL MARKET	Slightly incised, fr	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		Deaply incired	(or excavated),	
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-10 Stable point bars/t are present. Accer floodplain or fully bankfull benches.	nks. Vegetative or natural rock, 00%). AND/OR pankfull benches as to their original developed wide	erosion or unproted of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches,	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. See temporary/tran	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute	widen further. Major are near vertical. E 60-80% of bant protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp	rosion present on ks. Vegetative at on 20-40% of fficient to prevent 6 60-80% of the ad by sediment. orary/transient in	vertical/lateral in incision, flow cor banks. Streamber rooting depth, m vertical/underc protection present of banks, is not pre Obvious bank sle	stability. Severe trained within the ad below average najority of banks sut. Vegetative on less than 20% of eventing erosion. bughing present.	
	and transverse ba sediment deposition 10% of b	rs few. Transient n covers less than	portions of the r sediment cover	ed floodplains along reach. Transient rs 10-40% of the bottom.	stability, may be AND/OR V-shap vegetative protecti banks and depositi	on that contribute to forming/present. ed channels have on on > 40% of the ional features which to stability.	nature, and contrib AND/OR V-shape vegetative protectic 40% of the ban sediment depos	ed channels have on is present on > oks and stable		g channel. Greater n bed is covered by outing to instability. channels and/or	CI
Score	3		2	2.4		2	1.	6	1	l	1.6
NOTES>>		Oti cain is i	ocated iii de	•				1 30ille Cile	nnelization.		
. RIPARIAI	N BUFFERS: A	ssess both bank	c's 100 foot riparia			03-C-STR-0 ugh measuremen		h may be accep	table)		
. RIPARIAI	N BUFFERS: A	ssess both bank			e entire SAR. (ro			h may be accep	table)		
. RIPARIAI	N BUFFERS: A		Con	an areas along the	e entire SAR. (ro	ugh measuremen		or	NOTES>> Left bank is		
RIPARIAI Riparian Buffers		mal  3 inches) present, nopy cover and a lerstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the ditional Cate ptimal  Low Suboptimal:  Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy covered a	e entire SAR. (ro	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	ts of length & widt	or	NOTES>> Left bank is to I-95. Shru present on	ıb layer is	
Riparian	Option  Tree stratum (dbh > with > 60% tree canon-maintained und	mal  3 inches) present, nopy cover and a lerstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Left bank is to I-95. Shru present on	ıb layer is	
Riparian Buffers	Option  Tree stratum (dbh > with > 60% tree canon-maintained und	mal  3 inches) present, nopy cover and a lerstory. Weltlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> Left bank is to I-95. Shru present on	ıb layer is	
Riparian Buffers  Condition Scores  Delineate ripiescriptors. Determine scelelow.	Tree stratum (dbh > with > 60% tree ca a non-maintained und located within the	3 inches) present, nopy cover and a lerstory. Wellands a riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Covength and width. Covength and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums ipparian qual 100	NOTES>> Left bank is to I-95. Shru present on	ıb layer is	
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow.	Tree stratum (dbh > with > 60% tree ca a non-maintained und located within the located wi	3 inches) present, nopy cover and a lerstory. Wellands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Covength and width. Covength and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Left bank is to I-95. Shru present on	ıb layer is	
Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	3 inches) present, nopy cover and a lerstory. Wellands a riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Covength and width. Covength and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums ipparian qual 100	NOTES>> Left bank is to I-95. Shru present on	ıb layer is bank.	
Riparian Buffers  Condition Scores  Delineate rip: escriptors. Determine so	Tree stratum (dbh > with > 60% tree ca a non-maintained und located within the located wi	mal  3 inches) present, nopy cover and a lerstory. Wetlands in parian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Covength and width. Covength and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums ipparian qual 100	NOTES>> Left bank is to I-95. Shru present on Cl= (Sum % RA*S Rt Bank CI>	b layer is bank.	CI
Riparian Buffers  Condition Scores  Delineate riprescriptors. Determine scelow. Enter the % I Right Bank	Tree stratum (dbh > with > 60% tree ca a non-maintained und located within the located wi	mal  3 inches) present, nopy cover and a lerstory. Wellands e riparian areas.  55  Score for each ri 100% 0.85 100% 0.75	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	an areas along the ditional Categories and Congth and width. Can the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh 5) inches) present, with <30% tree canopy cover.  High  0.85  Indicators are provided to the control of the co	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Left bank is to I-95. Shru present on  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	b layer is bank.	CI 0.80
Condition Scores  Delineate ripescriptors Determine scelow Enter the % I	Tree stratum (dbh > with > 60% tree ca a non-maintained und located within the located wi	mal  3 inches) present, nopy cover and a lerstory. Wetlands in parian areas.  5  each stream ban ach by measurin  100%  0.85  100%  0.75  tried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) posent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Counthe blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Academic Scores us Calculators are provinced to the second of the secon	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Left bank is to I-95. Shru present on Cl= (Sum % RA*S Rt Bank CI>	b layer is bank.	
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  I. INSTREAI Indercut banks; Instream	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located within the strain areas along e quare footage for experience of the strain area and strai	mal  3 inches) present, nopy cover and a erestory. Wetlands riparian areas.  5  sach stream ban ach by measurin 100% 0.85  100% 0.75  tried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Coungth and width. Coungth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are province of the condition of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ed.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Left bank is to I-95. Shru present on  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	b layer is bank.	
Condition Scores  Delineate rip: lescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  Left Bank  Linstream Habitat/ Available	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located within the strategy of the located within the located locat	mal  3 inches) present, nopy cover and a erestory. Wetlands riparian areas.  5  ach stream ban ach by measurin 100% 0.85  100% 0.75  tried substrate si ffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in  izes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Coungth and width. Coungth and depths; wo res.  Conditional ptimal ments are typically % of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present with sample of the sample of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically % of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  Habitat elements lacking or are ur	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Left bank is to I-95. Shru present on I  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >  NOTES>>	b layer is bank.	
Riparian Buffers  Condition Scores  Delineate rip: escriptors. Determine scelow. Enter the % I Right Bank  Left Bank  Instream Habitat/	Tree stratum (dbh > with > 60% tree ca anon-maintained und located within the located wit	mal  3 inches) present, nopy cover and a erestory. Wetlands riparian areas.  5  ach stream ban ach by measurin 100% 0.85  100% 0.75  tried substrate si ffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in the category in t	an areas along the ditional Categorian Arional Cate	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh - 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided and leafy detail Category  Mar  Stable habitat ele present in 10-30 are adequate for are derived and category are adequate for are designed.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks existed and stabilized areas, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5	NOTES>> Left bank is to I-95. Shru present on I  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >  NOTES>>	b layer is bank.	

	St	ream In	npact A	ssessm	ent For	m Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	csx		VA	R4SB	02070010	10/27/2015	02-STR-27			
4. CHANNEI	L ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of ch	nannel, channeliz	ation,	NOTES>>	•	
embankments, s	poil piles, constrictions, livestock		Conditiona	I Category				Located in Some chan		
	Negligible	Mi	nor		erate	Sev	ere	present.	nenzation	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with gal cem	of the channel in the parameter PR 80% of banks bion, riprap, or			
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5			0.90
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			
NOTE: The CIs and R	RCI should be rounded to 2 decimal places. T	he CR should be roun	nded to a whole number	er.				CONDITION IN		
								I= (Sum of all C		0
						<u>'</u>		XLFXIF	WILITI (CIT) >>	U
INSERT PHO	TOS:									
DESCRIBÉ F	PROPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11

02-STR-27

Date: 10/27/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.717275
Evaluator: J. Budnik, M. Rockwell	County: Fairfax	Longitude: -77.212508
Total Points: 23 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral (intermitten) Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 7	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2)	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
3. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 7			<del>,</del>	
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	=3>
C. Biology (Subtotal = 9				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	(0.5)	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5)	1	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	$\triangleright$
-0				

Sketch:

# Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

		For us	e in ephemeral st	reams				
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Segment 3	VA	R6	02070010	10/27/2015			1

Name(s) of Evaluator(s) Stream Name and Information

02-STR-28 J. Budnik, M. Rockwell

RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Con	ditional Cate	gory				NOTES>> Stream
	Optimal	Subo	ptimal	Mar	ginal	Po	oor	originates in ditch
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	adjacent to railroad. Field Sheet: 03-C-STR- 02
		High	Low	High	Low	High	Low	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	
•	rian areas along each stream bank uare footage for each by measuring		-	_	•		the sums Riparian	
3. Enter the % R	iparian Area and Score for each ripa	arian category in the	ne blocks below.			Blocks e	equal 100	
Right Bank	% Riparian Area> 25%	75%					100%	
Rigiil Bank	Score > 0.5	0.85						
•				•				CI= (Sum % RA * Scores*0.01)/2

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

25%

0.75

75%

0.85

% Riparian Area>

Score >

Left Bank

THE REACH CONDITION INDEX (RCI) >> 0.40 RCI= (Riparian CI)/2

0.76

0.83

CI

0.79

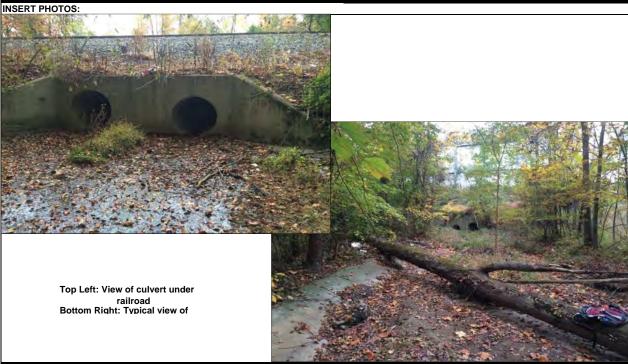
COMPENSATION REQUIREMENT (CR) >> 0

Rt Bank CI >

Lt Bank CI >

CR = RCI X LF X IF

100%



NC DWQ Stream Identification Form Version 4.11

02-STR-28

Date: 10/27/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.714125
Evaluator: J. Budnik, M. Rockwell	County: Fairfax	Longitude: -77.216213
<b>Total Points:</b> 10.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemera Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 4)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5)	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $1.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?		0 = 0	Yes	= 3

C. Biology (Subtotal = 5				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75: (	OBL = $1.5$ Other = $0$	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream appears to originate in railroad ditch adjacent to ballast. Field sheet: 03-C-STR-02

Sketch: Pairton of Patrick 198

		Stre			ment lethodology f		) (For	m 1)			
			For use in	wadeable chan	nels classified a	s intermittent or	perennial		Impact/SAR	Impost	
Project #	l	Project Name	•	Locality	Class.	HUC	Date	SAR#	length	Impact Factor	
N/A		RVA - Segm		VA	R2SB2	02070010	10/22/2015				
Nam	e(s) of Evalua K. Astroth	tor(s)	Stream Nam	e and Informa		TD 20	(D. 1 : 1 O				
Channel C	Condition: Asse	ase the cross-sec	tion of the stream	and prevailing o			(Pohick C	reek)			
i. Onamici c		imal			onditional Catego		Po	or	Sev	vere	
		The state of the s		Je se	~	less than Severe or	Overwiden	5	1	5	
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches.	00%). AND/OR /bankfull benches ess to their original	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	ew areas of active ted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR ures contribute to ktfull and low flow Il defined. Stream o bankfull benches, of floodplains along each. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe wer bank slopes. seent on 40-60% of lative protection on Streambanks may rrcut. AND/OR 40- is covered by diment may be sient, contribute to forming/present.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/Of stream is covere Sediment is temp	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	banks, is not pre Obvious bank slo Erosion/raw ban	stability. Severe tained within the ed below average najority of banks tut. Vegetative on less than 20% of eventing erosion. bughing present. lks on 80-100%.	
	sediment deposition 10% of	on covers less than bottom.	sediment cover	each. Transient is 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protecti 40% of the bar	on is present on > aks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	outing to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1	ı	2.4
2. RIPARIAI	N BUFFERS: A	Assess both bank	s's 100 foot riparia	n areas along the	e entire SAR (ro						
	Onti	imal	Con	ditional Cate	gory				NOTES>>		
Riparian Buffers	Tree stratum (dbh :	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.	NOTES>>		
•	Tree stratum (dbh : with > 60% tree canon-maintained und	> 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>>		
Condition Scores  1. Delineate ripidescriptors. 2. Determine sc	Tree stratum (dbh : with > 60% tree canon-maintained und	> 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>		
Condition Scores  Delineate ripiescriptors.  Determine scorelow.	Tree stratum (dbh swith > 60% tree or non-maintained un located within the located within	> 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas. each stream ban each by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 33% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  ne sums iparian qual 100	NOTES>>		
Condition Scores  1. Delineate ripiescriptors. 2. Determine so	Tree stratum (dbh with > 60% tree canon-maintained un located within th	> 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas. each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low	NOTES>>		
Condition Scores  Delineate rip: lescriptors. Determine scielow. Enter the % I	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	> 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  each stream ban each by measurin  Score for each ri  20%  0.85	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  k into Condition C g or estimating le parian category in 80% 1.1	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  Low  100 100%	NOTES>>		
Condition Scores  Delineate rip: lescriptors. Determine scielow. Enter the % I	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th  arian areas along i uare footage for e Riparian Area and % Riparian Area> % Riparian Area>	> 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  each stream ban each stream ban bach by measurin 20% 0.85	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  k into Condition C g or estimating le parian category in 80% 1.1	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  ne sums iparian qual 100	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	1.05	CI
Condition Scores  Delineate ripi descriptors. Descriptors. Enter the % I Right Bank  Left Bank  B. INSTREAI	Tree stratum (dbh : with > 60% free cc non-maintained und located within th  arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >	> 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  each stream ban each stream ban bach by measurin 20% 0.85  80% 0.85  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  k into Condition C g or estimating le parian category in 80% 1.1  20% 1.1  zes, water velocit	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  Ensure to 6 % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  Low 100%	NOTES>>		C1 0.98
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh : with > 60% tree cc non-maintained un located within th located within th  arian areas along a uare footage for e Riparian Area and % Riparian Area> Score >	> 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  each stream ban each stream ban bach by measurin 20% 0.85  80% 0.85  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  k into Condition C g or estimating le parian category in 80% 1.1  20% 1.1  zes, water velocit	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  Calculators are provided the control of the control o	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  Ensure to 6 % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  Low 100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.05	
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI	Tree stratum (dbh : with > 60% tree canon-maintained una located within the located withi	> 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  each stream ban each stream ban bach by measurin 20% 0.85  80% 0.85  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  k into Condition C g or estimating le parian category in 80% 1.1  20% 1.1  zes, water velocit exes, stable featur	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  Low  attegories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  Aight Might	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  Low  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  Ensure to of % R Blocks en Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, traits other comparable conditions.  Low  Low  100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.05	
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	Tree stratum (dbh : with > 60% free cc non-maintained und located within th located within th located within th  arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  W HABITAT: Va root mats; SAV; r	> 3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  each stream ban each by measurin Score for each ri 20% 0.85  80% 0.85  aried substrate si iffle poole completimal	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches with tree stratum (dbh - 3 inches present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  k into Condition C g or estimating leeparian category in 80% 1.1  20% 1.1  zes, water velocitieses, stable features suboptimes stable features suboptimes s	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  Low  the blocks below  the blocks below  the blocks below  conditional  ptimal  ments are typically 6 of the reach and realineance of	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High  Addition Scores us Calculators are provided and leafy determined by and leafy de	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  Low  sing the ovided for you  ginal  ments are typically 6 of the reach and realiteance of maintained of maintained or maintenance of	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area pasture, sparsely vegetated non-maintained and stabilized, or other comparable condition.  High  Ensure to descript the stability of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  Low  100%  100%  100%	CI= (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>>	1.05	0.98
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/ Available	Tree stratum (dbh : with > 60% tree ca non-maintained un located within th located within th  arian areas along of quare footage for e Riparian Area and % Riparian Area > Score >  % Riparian Area > Score >  M HABITAT: Va root mats; SAV; r	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  each stream ban each stream ban bach by measurin  20%  0.85  80%  0.85  aried substrate si iffle poole completified poole completimal  are typically present io% of the reach.	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  k into Condition C g or estimating le parian category in 80% 1.1  20% 1.1  zes, water velocit exes, stable featur  Suboy are adequate fo popul	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  categories and Co ngth and width. ( In the blocks below y and depths; wo res.  Conditiona ptimal ments are typically 6 of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  Addition Scores us Calculators are provided to the canopy cover.  Lacture of the canopy cover.  Stable habitat ele present in 10-30% are adequate fo popul	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  Low  sing the ovided for you  ginal ments are typically 6 of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-read and stabilized, or other comparable condition.  High  Ensure to of % R Blocks en Blocks	Low Poor: Impervious surfaces, mine spoil fands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  Low  100%  100%  100%  1100%	CI= (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>>	1.05	

	St	ream In	npact A	ssessm	ent For	m Page	2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB2	02070010	10/22/2015	02-STR-29		
	CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, pankments, spoil piles, constrictions, livestock  Conditional Category								
	Negligible	Mir	nor		erate	Sev	ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.		60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with gal cem	of the channel in the parameter R 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5		

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> 1.14

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: Typical view upstream, under railroad bridge
Bottom Right: Typical view downstream away from railroad



NC DWQ Stream Identification Form Version 4.11 Pohick Creek 02-STR-29

THE BY Q BITCHIN INCHINEURION I OTHER VEI	DIOII IIII	
Date: 10/22/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.712856
Evaluator: K. Astroth	County: Fairfax	Longitude: -77.217492
<b>Total Points:</b> 39.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennia	Other e.g. Quad Name:

n = 10 or peroninar n = 00				
A. Geomorphology (Subtotal = 18.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	(3)
Active/relict floodplain	0	(1)	2	3
Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	<u>(1)</u>	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel		0 = 0	Yes	
<sup>a</sup> artificial ditches are not rated; see discussions in manual				<u> </u>
B. Hydrology (Subtotal = 8				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes:	= 3
C. Biology (Subtotal = <u>12.75</u> )		_		
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5	1	(1.5)
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	(0.5)	Y	1.5
26. Wetland plants in streambed		FACW = 0.75	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other method	ds. See p. 35 of manual	l.		
Notes: Pohick Creek, clear water, abundant fish i	ncl. northern hogsu	ucker; minnows;	and sunfish.	
Sand/boulders/cobble present in stream b	ed. Field Sheet: 03	3-B-STR-02		
Sketch: - STR	MEAN DESCRIPTION	£100	N	
10000	The same of the sa			
To sord bar lance repract	7			

		Stre		SSESS fied Stream M			-	m 1 <i>)</i>		
				wadeable chan	nels classified a				Impact/SAR	Impact
Project #		Project Name		Locality	Class.	HUC	Date	SAR#	length	Factor
N/A	DC2RVA - Segment 3		VA	R2SB3	02070010	10/23/2015				
Nam	ne(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation					
	K. Astroth					02-S	ΓR-30			
. Channel (	Condition: Asse	ess the cross-sec	tion of the stream	and prevailing co	ondition (erosion,	aggradation)				
	Opti	imal	Subo	ptimal	onditional Categor	ginal	Po	or	Sev	/ere
	1	Les	Slightly incised for	ew areas of active		less than Severe or stable than Severe	Overwiden Vertically/laterally		Deeply incised	(or excavated),
Channel Condition	Very little incision on 100% stable ban surface protection prominent (80-1). Stable point bars/ are present. Accer floodplain or fully bankfull benches, and transverse be sediment deposition 10% of 10% of 10%.	nks. Vegetative n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient on covers less than	of banks are s Vegetative protect prominent (60- Depositional feal stability. The bar channels are we likely has access to or newly develope portions of the r sediment cover	cted banks. Majority table (60-80%). table (60-80%). To not natural rock-80%) AND/OR tures contribute to kfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient is 10-40% of the bottom.	or Poor due to lo Erosion may be pri both banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. See temporary/trani instability. Depositic stability, may be AND/OR V-shap vegetative protecti banks and depositi	wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present. ed channels have on on > 40% of the lonal features which	widen further. Maj are near vertical. 60-80% of ban protection prese banks, and is insu erosion. AND/OI stream is coverr Sediment is temp nature, and contril AND/OR V-shape vegetative protect 40% of the bar	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent & 60-80% of the ed by sediment. orary/transient in outing to instability. d channels have on is present on > ks and stable	incision, flow corbanks. Streambe rooting depth, rn vertical/underc protection present to banks, is not pre Obvious bank sls Erosion/raw bar AND/OR Aggradin than 80% of strean deposition, contrib	cut. Vegetative on less than 20% of eventing erosion. oughing present. lks on 80-100%. g channel. Greater n bed is covered by buting to instability. channels and/or
Score	3	•	2	2.4		to stability.	1.		oustonan	
NOTES>>	Banks are	incised an	d near verti	cal. Some ui	ndercutting	present. Vu	Inerable to e	rosion. Fie	ld Sheet: 03	-B-STR-03
. RIPARIA	N BUFFERS: A	Assess both bank	d's 100 foot riparia	an areas along the	e entire SAR. (rou	ugh measuremen	ts of length & wid	h may be accep	table)	
. RIPARIA			Con	ditional Cate	gory				notes>>	
Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hosy production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.			
Riparian	Option  Tree stratum (dbh with > 60% tree canon-maintained und	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or		
Riparian Buffers	Option  Tree stratum (dbh with > 60% tree canon-maintained und	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine selelow.	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	ditional Categories and Congth and width. Categories and Congth and width. Categories and with the stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low		
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine selow.	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  each stream ban each by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  k into Condition C g or estimating le parian category in 50%	ditional Categories and Congth and width. Categories and Congth and width. Categories and with the stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine selow. Enter the %	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	ditional Categories and Congth and width. Categories and Congth and width. Categories and with the stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low		cores*0.01)/2
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine selow. Enter the %  Right Bank	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  each stream ban each by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  k into Condition C g or estimating le parian category in 50%	ditional Categories and Congth and width. Categories and Congth and width. Categories and with the stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low	NOTES>>	cores*0.01)/2
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine selow.	Tree stratum (dbh > with > 60% tree cc on non-maintained und located within the located w	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  each stream baneach by measurin  Score for each ri  50%  1.1	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  k into Condition C g or estimating le parian category in 50% 0.85	ditional Categories and Congth and width. Categories and Congth and width. Categories and with the stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low	NOTES>>  CI= (Sum % RA * S	
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Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine selow. Enter the % Right Bank  Left Bank Left Bank Instream Habitat/	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	each stream baneach by measurin  Score for each ri  60%  1.1  aried substrate si iffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  k into Condition C g or estimating le parian category in 50% 0.85  40% 0.85  zes, water velocit exes, stable featu	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  Categories and County and the blocks below the property of the county ty and depths; wo res.  Conditiona ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  Addition Scores us Calculators are provided to the control of the co	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  Low  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low  Low  100%  100%  100%	CI= (Sum % RA * S Rt Bank CI > Lt Bank CI > Varied substrate, shotstrate, sho	0.98 1.00 rate, water depths, stable lade, root
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine selow. Enter the % Right Bank  Left Bank Left Bank INSTREA ndercut banks Instream Habitat/ Available	Tree stratum (dbh with > 60% tree canon-maintained und located within the located within	each stream ban each by measurin Score for each ri 50% 1.1 arried substrate si iffle poole completimal re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  k into Condition C g or estimating le parian category in 50% 0.85  40% 0.85  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	ditional Categories and Congth and width. Congth and depths; wo res.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  Migh  Calculators are provided in Category  Mary  Stable habitat eler present in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  Ensure to of % R Blocks en Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or of other comparable conditions.  Low  100%  100%  100%  Or listed above are stable. Habitat	NOTES>>  C  = (Sum % RA * S  Rt Bank CI >  Lt Bank CI >  Varied substivelocity, and leafy debris,	0.98 1.00 rate, water depths, stable lade, root bededness,
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#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point Project # Date SAR length Impact Factor CSX R2SB3 02070010 10/23/2015 02-STR-30 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Channelization. Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. 1.5 0.5 SCORE 1.3 1.1 0.9 0.7 1.30 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

CR = RCI X LF X IF

#### INSERT PHOTOS:





Top Left: View of culvert carying stream under

the railroad

Top Right: Typical view of stream Bottom Left: Typical view of stream

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

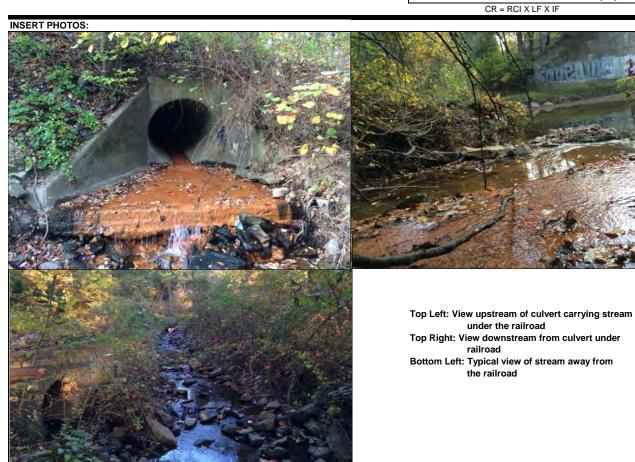
Date: 10/23/2015

02-STR-30

County: Fairfax   Stream Determina Ephemeral Intern	Weak  1  1  1  1  1  1  1  0.5  0.5		Strong  3 3 3 3 3 3 1.5 1.5
Absent	Weak  1 1 1 1 1 1 1 0.5	e.g. Quad Name:    Moderate   (2)	\$\frac{3}{3}\$ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
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3		1	1.5
	<u>.</u>	Yes =	= 3
	2	(1)	0
(3)	2	1	0
0	1	(2)	3
0	(1)	2	3
0	0.5	(1)	1.5
0	0.5	(1)	1.5
0	0.5	(1)	1.5
0	0.5	(1)	1.5
	FACW = 0.75), (		
-	Flows into 03-S	STR-02. Field Shee	t: 03-B-STR
0 0 0 0 cer methods. See p. 35 of manual.	_	0.5 0.5 0.5 FACW = 0.75), (	0.5 (1) 0.5 (1) 0.5 (1)

		Stre					ı (Fori	11 1 <i>)</i>			
				fied Stream N wadeable chan							
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		RVA - Segme		VA	R2SB3	02070010	10/23/2015				
Nam	e(s) of Evaluat	or(s)	Stream Nam	e and Informa	ation	00.0	TD 04				
Channal C	K. Astroth			1 22	P.C. Constant		TR-31				
Channel	Condition: Asse				onditional Catego		Po	~*	Sou	/ere	
	Ори	IIIai	Subo	ptimai	IVIAI	giriai			//	/ere	
	1	W W	Slightly incised, fr	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally u		Deaply insisted	(or excavated),	
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-10 Stable point bars/k are present. Acces floodplain or fully	nks. Vegetative or natural rock, 00%). AND/OR pankfull benches as to their original developed wide	erosion or unproter of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow Il defined. Stream o bankfull benches,	or Poor due to lo Erosion may be pro both banks. Vegel 40-60% of banks. bevertical or unde 60% of strean sediment. Sec	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute	widen further. Majc are near vertical. E 60-80% of bank protection preser banks, and is insul erosion. AND/OF stream is covere Sediment is tempo	ority of both banks rosion present on as. Vegetative at on 20-40% of ficient to prevent to 60-80% of the d by sediment.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, n vertical/underc protection present of banks, is not pre	stability. Severe ntained within the ed below average najority of banks cut. Vegetative on less than 20% of eventing erosion.	
	bankfull benches. I and transverse ba sediment deposition 10% of b	rs few. Transient n covers less than	or newly develope portions of the r sediment cover	o bankfull benches, dd floodplains along reach. Transient rs 10-40% of the bottom.	instability. Deposition stability, may be AND/OR V-shap vegetative protecti banks and depositi	on that contribute to forming/present. ed channels have ion on > 40% of the ional features which to stability.	nature, and contrib AND/OR V-shape vegetative protection 40% of the band	uting to instability. d channels have on is present on > ks and stable	Erosion/raw ban AND/OR Aggradin	g channel. Greater n bed is covered by outing to instability. channels and/or	CI
Score	3		2	4	:	2	1.	6	1	1	1.6
IOTES		R	anke noar w	artical Som	a undarcutti	na nracant	Field Sheet	N3-R-STR			
	N BUFFERS: A			ertical. Som							
		ssess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep	table)		
RIPARIAI	Optin  Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a lerstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy covered a	e entire SAR. (roo	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with		h may be accep	NOTES>> S originates a Exposed str approximate	it culvert. ream is	
RIPARIAI Riparian	Option  Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a lerstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorium l  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po- High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious sourfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> S originates a Exposed str approximate	it culvert. ream is	
RIPARIAI Riparian Buffers	Option  Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a lerstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained	Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	NOTES>> S originates a Exposed str approximate	it culvert. ream is	
RIPARIAI Riparian Buffers	Option  Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a leerstory. Wetlands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorium l  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po- High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious sourfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> S originates a Exposed str approximate	it culvert. ream is	
RIPARIAI Riparian Buffers  Condition Scores Delineate ripiscriptors. Determine solow.	Option  Tree stratum (dbh > with > 60% tree canon-maintained und located within the	mal  3 inches) present, nopy cover and a lerestory. Wetlands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> S originates a Exposed str approximate	it culvert. ream is	
Riparian Buffers  Condition Scores  Delineate rip: scriptors. Determine so	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a lerestory. Wetlands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr of % Ri	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> S originates a Exposed sti approximate	nt culvert. ream is ely 30 feet.	
Riparian Buffers  Condition Scores  Delineate rips scriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	mal  3 inches) present, nopy cover and a lerstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr of % Ri	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> S originates a Exposed str approximate	nt culvert. ream is ely 30 feet.	CI
RIPARIAI Riparian Buffers  Condition Scores  Delineate rips scriptors. Determine scores low. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr of % Ri	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%	NOTES>> Soriginates a Exposed strapproximate	t culvert. ream is ely 30 feet.	CI 0.76
RIPARIAI  Riparian Buffers  Condition Scores  Delineate rip. Scriptors. Determine sclow. Enter the % I	Tree stratum (dbh > with > 60% tree ca a non-maintained und located within the located wi	3 inches) present, nopy cover and a terstory. Wetlands riparian areas.  5 each stream ban ach by measurin 100% 0.75 20% 0.85	Cs 100 foot riparia  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in  80% 0.75  Zes, water velocii	an areas along the ditional Categories and County of the blocks below the blocks below the ditional Categories and County of the blocks below the blocks below the ditional Categories and County of the blocks below the categories and County of the categories and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are province.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks economics of the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%	NOTES>> Soriginates a Exposed sti approximate  CI= (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>>	cores*0.01)/2 0.75 0.77	
RIPARIAI Riparian Buffers  Condition Scores  Delineate ripsoriptors. Determine sclow. Enter the % I Right Bank  Left Bank  INSTREAI dercut banks;	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.  5 sach stream ban ach by measurin 100% 0.75  20% 0.85 tried substrate siffle poole complete the stream of the st	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  80% 0.75  zes, water velocit exes, stable featu	an areas along the ditional Categoretimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (congth and width. (cong	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks ed.	Low Poor: Impervious surfaces, mine spoil lands, dendued surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Soriginates as Exposed strapproximate approximate approxim	cores*0.01)/2 0.75 0.77	
RIPARIAI  Riparian Buffers  Condition Scores  Delineate rip. scoriptors. Determine sclow. Enter the % I Right Bank  INSTREAI dercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	3 inches) present, nopy cover and a erestory. Wetlands riparian areas.  5 each stream ban ach by measurin 100% 0.75 20% 0.85 uried substrate si ffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  80% 0.75  Zes, water velocit exes, stable featu  Subo  Stable habitat ele	an areas along the ditional Categories and Congth and width. Categories and Congth and C	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks econds and stabilized	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel foliations.  Low 0.5  Low 0.5  Low 0.5  100%  100%	NOTES>> Soriginates as Exposed strapproximate approximate approxim	cores*0.01)/2 0.75 0.77  f stream considered	
Riparian Buffers  Condition Scores  Delineate rip: scriptors. Determine sclow. Enter the % I Right Bank  Left Bank  INSTREAL idercut banks; Instream	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	mal  3 inches) present, nopy cover and a lenstory. Wetlands riparian areas.  5  5  5  6  6  7  8  8  8  8  8  9  9  9  9  9  9  9  9	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in  80% 0.75 zes, water velocit exes, stable featu Subo Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (6th >3 inches) present, with +30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lols, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%	NOTES>> Soriginates as Exposed sti approximate approxi	cores*0.01)/2 0.75 0.77  f stream considered	

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX	CSX		R2SB3	02070010	10/23/2015	02-STR-31		
	CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, hortest Majority of stream within culvert.								
	Conditional Category  Negligible Minor Moderate Severe								
	Negligible	IVII	nor			Sev	ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/O shored with gal cem	of the channel in the parameter oR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5		
	REACH C	ONDITION II	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH		
VOTE: The CIs and F	RCI should be rounded to 2 decimal places. T	he CR should be roun	ided to a whole number	er.			THE REACH	CONDITION IND	EX (RCI) >>
							RC	I= (Sum of all CI	's)/5
							COMPENSAT	ION REQUIREM	ENT (CR) >>



NC DWQ Stream Identification Form Version 4.11

02-STR-31

Date: 10/23/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.712773
Evaluator: K. Astroth	County: Fairfax	Longitude: -77.217688
<b>Total Points:</b> 35.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent (Perennial)	Other e.g. Quad Name:
A. O	A beaut Meals	Madayata Strong

A. Geomorphology (Subtotal = 16	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	(1.5)	1	1.5
11. Second or greater order channel	N	o = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $8.5$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	(3)
14. Leaf litter	1.5	1	().5)	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16 Organic debris lines or piles	0	0.5	(1)	1.5

12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	(3)
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?		lo = 0	Yes	= 3
C. Biology (Subtotal = 10.75)				

C. Biology (Subtotal = $10.75$			_	
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5	(1)	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75)	OBL = 1.5 Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream flows from culvert. Strong discharge into 03-B-STR-02. Unclear where culvert originates. Flows down riffle into STR-02. Fish are in pool at base of culvert. Field Sheet: 03-B-STR-04

Sketch:

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin mpact/SAR Impact SAR# Project # **Project Name** Locality Date length Factor 10/22/2015 N/A DC2RVA - Segment 3 ۷A 02070010 1 Name(s) of Evaluator(s) Stream Name and Information K. Astroth 02-STR-32 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category Drainage at Optimal Suboptimal Marginal intersection of Lorton Low Marginal: Non-maintained, ligh Poor: Lawns mowed, and Road and railroad. High Suboptimal Low Suboptima Few trees along riprap Low Poor: Impervious surfaces, mine High Marginal: Non-maintained, ense herbaceou maintained areas nurseries; no-till Riparian areas with tree stratum (dbh : 3 inches) present, with >30% tree Riparian areas with ree stratum (dbh: egetation, riparia portion; dense ense herbaceo reas lacking shru and tree stratum cropland; actively grazed pasture, 3 inches) present, with 30% to 60% herbaceous layer Tree stratum (dbh > 3 inches) presen with > 60% tree canopy cover and ar non-maintained understory. Wetland spoil lands, Riparian with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory. with >30% tree canopy cover and maintained understory. Rece cutover (dense vegetation). ner a shrub lay hay production, parsely vegetate non-maintained nuded surfac present. Very dry; no Buffers or a tree layer (db > 3 inches) present, with <30° onds, open water row crops, active area, recently seeded and tabilized, or oth water. eed lots, trails, o If present, tree stratum (dbh >3 other comparab conditions. Field sheet: 03-B-STRinches) present, with <30% tree tree canopy cover comparable condition. canopy cover wit maintained understory. High Low High Low High Low 1.5 0.85 0.75 0.6 0.5 1.2 1.1 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below of % Riparian Blocks equal 100 Enter the % Riparian Area and Score for each riparian category in the blocks belo 85% 15% 100% Right Bank 0.75 0.85 I= (Sum % RA \* Scores\*0.01)/2 80% 20% 100% Rt Bank CI > 0.77 CI Left Bank Lt Bank CI > 0.77 0.77 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH 0.39 RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCLX LF X IF INSERT PHOTOS:



Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 10/22/2015

02-STR-32

Evaluator: K. Astroth	County: Fairfax		Longitude: -77.220610		
<b>Total Points:</b> 17.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal = 10 )	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	(1)	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
Particle size of stream substrate	0	1	2	(3)	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	(1)	2	3	
7. Recent alluvial deposits	0	(1)	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	(0.5)	1	1.5	
11. Second or greater order channel	No	0 = 0	Yes:	= 3	
a artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = 2.5					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	(0)	1	2	3	
14. Leaf litter	1.5	(1)	0.5	0	
15. Sediment on plants or debris	0	(0.5)	1	1.5	
16. Organic debris lines or piles	0	0.5	(1)	1.5	
17. Soil-based evidence of high water table?	(No	0 = 0	Yes:	= 3	
C. Biology (Subtotal = 5					
18. Fibrous roots in streambed	3	(2)	1	0	
19. Rooted upland plants in streambed	(3)	2	1	0	
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3	
21. Aquatic Mollusks	(0)	1	2	3	
22. Fish	(0)	0.5	1	1.5	
23. Crayfish	(0)	0.5	1	1.5	
24. Amphibians	(0)	0.5	1	1.5	
25. Algae	(0)	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0		
*perennial streams may also be identified using other methods	s. See p. 35 of manua	al.			
Notes: Dry channel. Large rip rap for approximatel	y 30 meters after	Culvert 1. Field Sh	eet 03-B-STR-0	1	
Sketch: Sketch: 10508906890	Scroll de Noted				

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor N/A DC2RVA - Area 02 02070010 10/22/2015 Name(s) of Evaluator(s) Stream Name and Information 02-STR-33 K. Astroth 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> SAR is only ~25m. Optimal Suboptimal Marginal Most of the stream Low Marginal: High Poor: is contained in Lawns, mowed, and maintained Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canop Riparian areas with tree stratum (dbh > 3 inches) Low Poor: egetation, riparia areas lacking shrub and tree stratum, hay lon-maintained, nse herbaceou culverts. Stream is areas, nurseries no-till cropland; Impervious surfaces, mine very dry. Bed vegetation with either a shrub Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and an non-maintained understory. Wetlands resent, with 30% to 60% tree actively grazed pasture, sparsely spoil lands, nuded surface Riparian cover and a maintained understory. layer or a tree layer (dbh > 3 inches) present, with <30% tree roduction, ponds open water. If present, tree stratum (dbh >3 consists of rip-rap Buffers anopy cover an vegetated non-naintained area row crops, active eed lots, trails, or and sand. Field containing both areas. herbaceous and shrub layers or a recently seeded and stabilized, or other comparable conditions. Recent cutover (dense vegetation). Sheet: 04-B-STR-17. canopy cover. inches) present with <30% tree ther comparat understory. condition. nopy cover wit maintained understory. High Low High Low High Low Condition 0.85 0.75 0.6 0.5 1.5 1.2 1.1 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums . Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 80% 20% 100% Right Bank Score : 0.85 0.75 I= (Sum % RA \* Scores\*0.01)/2 60% 40% 100% Rt Bank CI > 0.83 CI Left Bank Lt Bank CI > 0.75 0.81 0.82 0.85 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.41 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF INSERT PHOTOS: Top Left: View of culvert Bottom Right: Typical view of stream DESCRIBE PROPOSED IMPACT:

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 10/22/2015

02-STR-33

	+				
Evaluator: K. Astroth	County: Fairfax		Longitude: -77.221992		
Total Points: 12.5	Stream Determi	nation (circle one)	Other		
Stream is at least intermittent		ermittent Perennial	e.g. Quad Name:		
if ≥ 19 or perennial if ≥ 30*	_рпошогал		o.g. quad mamor		
A. Geomorphology (Subtotal = 7)	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3	
2. Sinuosity of channel along thalweg	0	(1)	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain		1		3	
6. Depositional bars or benches	(0)	1	2	3	
7. Recent alluvial deposits		(1)	2	3	
8. Headcuts	Ŏ	1	2	3	
9. Grade control		0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel		0 = 0	Yes :		
artificial ditches are not rated; see discussions in manual	INC		162 :	- J	
B. Hydrology (Subtotal = 1.5)					
12. Presence of Baseflow	(0)	1	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	No	0 = 0	Yes =		
C. Biology (Subtotal = 4)			_		
18. Fibrous roots in streambed	3	2	(1)	0	
19. Rooted upland plants in streambed	<b>3</b>	2	1	0	
20. Macrobenthos (note diversity and abundance)	<del>                                     </del>	1	2	3	
21. Aquatic Mollusks		1	2	3	
22. Fish		0.5	1	1.5	
23. Crayfish		0.5	1	1.5	
24. Amphibians		0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0		
*perennial streams may also be identified using other methods	s. See p. 35 of manua				
Notes: No water. Very dry. Heavy woody vines alo			d sand. Field Sh	eet:	
04-B-STR-17.	<u> </u>	1 1 2			
Sketch: culvert FLOW 34	culvert 35	Lorton Market St.			

		Stre		SSESS			(For	m 1)			
				wadeable chan							
Project #		Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	02	VA	R4SB5	02070010	10/21/2015				
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
	K. Astroth					02-S	ΓR-34				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal	onditional Catego Mar	ginal	Po	or	Sev	/ere	
	Channel  Very little incision or active erosion; 80 100% stable banks. Vegetative		Slightly incised, few areas of active		Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute		Overwiden	ed/incised.	1	5	
Channel Condition							Vertically/laterally unstable. Likely to widen further. Majority of both banks		s Deeply included to excavate of a contract		
	10% of		sediment cover	rs 10-40% of the bottom.	vegetative protecti banks and deposit	ed channels have ion on > 40% of the ional features which to stability.		iks and stable			CI
Score	3	3	2	4		2	1.	6	1	I	2.0
2. RIPARIAI	N BUFFERS: /	Assess both bank	d's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	to of loweth 0 wide		itable)		
			Con	ditional Cate	norv	agii illeadareilleil	its of length & widi	h may be accep			
	Opt	imal		ditional Cate		ginal	Po		NOTES>>	mostly	
Riparian Buffers	Tree stratum (dbh : with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	Suboj  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.		High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.		Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Or  Low Poor:	NOTES>> Stream is r encapsulat Culverts 27 Only about reach is ev this form.	ted by 7 and 28. t 30 feet of	
Buffers	Tree stratum (dbh: with > 60% tree canon-maintained un	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> Stream is r encapsulat Culverts 27 Only about reach is ev this form.	ted by 7 and 28. t 30 feet of	
	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	> 3 inches) present, anopy cover and a derstory. Wetlands	Suboj  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal:  Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Stream is r encapsulat Culverts 27 Only about reach is ev this form.	ted by 7 and 28. t 30 feet of	
Condition Scores  1. Delineate ripi descriptors. 2. Determine so	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strain areas along quare footage for e	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicator of the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Stream is r encapsulat Culverts 27 Only about reach is ev this form.	ted by 7 and 28. t 30 feet of	
Condition Scores  1. Delineate ripidescriptors. 2. Determine scorelow.	Tree stratum (dbh: with > 60% tree or non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  .5  each stream ban each by measurin Score for each ri	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicator of the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Stream is r encapsulat Culverts 27 Only about reach is ev this form.	ted by 7 and 28. t 30 feet of	
Condition Scores  Delineate riplescriptors. Determine scielow. Enter the % I	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strain areas along quare footage for e	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicator of the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Stream is r encapsulat Culverts 27 Only about reach is ev this form.	ted by 7 and 28. t 30 feet of raluated in	
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	5 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream baneach by measurin Score for each ri 50% 0.75	Subor  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicator of the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Stream is r encapsulat Culverts 27 Only about reach is ev this form.  Cl= (Sum % RA * Si Rt Bank Cl >	ted by 7 and 28. t 30 feet of raluated in	CI
Condition Scores  1. Delineate rip descriptors. 2. Determine Scoelow. 3. Enter the % I Right Bank	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  55  each stream baneach by measurin  Score for each ri  50%  0.75	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1 Categories and Congth and width. (and the blocks below	Mar  High Marginal: Non-maintained, dense harbeeous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) from the canopy cover.  High  0.85  Indicate the canopy cover are canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Stream is r encapsulat Culverts 27 Only about reach is ev this form.  Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl >	ted by 7 and 28. t 30 feet of valuated in	CI 0.80
Condition Scores  Delineate rip descriptors. Enderwine scoledw. Condition Co	Tree stratum (dbh: with > 60% tree cz non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi	5 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream baneach by measurin 50% 0.75 50% 0.75 arried substrate si	Subor  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Coungth and width. (In the blocks below	Mar  High Marginal: Non-maintained, dense harbeeous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) from the canopy cover.  High  0.85  Indicate the canopy cover are canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Stream is r encapsulat Culverts 27 Only about reach is ev this form.  Cl= (Sum % RA * Si Rt Bank Cl >	ted by 7 and 28. t 30 feet of raluated in	
Condition Scores  1. Delineate rip descriptors. 22. Determine scoelow. 33. Enter the % I Right Bank  Left Bank  3. INSTREAI	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  -5  -6  -6  -6  -6  -7  -7  -7  -7  -7  -7	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in 50%  0.85  50%  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopto cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. ( n the blocks below  by and depths; wo res.  Conditiona	High Marginal: Non-maintained, weight a consider a shruld layer or a tree layer (bhr > 3 layer or a tree layer (bhr > 30 km tree canopy cover.  High  0.85  Indition Scores us Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Stream is r encapsulat Culverts 27 Only about reach is ev this form.  Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl >	ted by 7 and 28. t 30 feet of raluated in	
Condition Scores  1. Delineate ripidescriptors. 2. Determine schelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	5 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream baneach by measurin 50% 0.75 50% 0.75 arried substrate si	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing bosh herbaceos and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.85  50% 0.85  zes, water velocit syboptimal category system of the strategory of the system of the syst	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. ( In the blocks below  ty and depths; wo res.  Conditiona ptimal	Mar  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present with canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you  pris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Stream is r encapsulat Culverts 27 Only about reach is ev this form.  Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl >	ted by 7 and 28. t 30 feet of raluated in	
Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree ca non-maintained un located within th  1.  arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> core >  M HABITAT: Warea to the control of the contro	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  -5  -5  -6  -6  -6  -6  -7  -7  -7  -7  -7  -7	Subol  High Suboptimal: Riparian areas with tree stratum (dbn - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in 50% 0.85  50% 0.85  zes, water velocit exes, stable feature Subol Stable habitat eler present in 30-50%	ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. ( n the blocks below  by and depths; wo res.  Conditiona ptimal ments are typically & of the reach and	Mar  High Marginal: Non-maintained, use yegetation with either a shrub layer or a tree layer (bhr > 30 tree canopy cover.  High  0.85  Indition Scores use calculators are provided the same pro	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically % of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en  ate; low embeded  Habitat elements lacking or are ur	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Stream is r encapsulat Culverts 27 Only about reach is ev this form.  Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl >	ted by 7 and 28. t 30 feet of raluated in	0.80
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cz non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi. root mats; SAV; r  Opti Habitat elements a in greater than 5	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  -5  -5  -6  -6  -6  -6  -7  -7  -7  -7  -7  -7	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.85  2es, water velocit exes, stable featur  Subop Stable habitat elei present in 30-509 are adequate fo popul	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. (and the blocks below the blocks	High Marginal: Non-maintained, use defended in the layer of a tree canopy cover.  High  0.85  Calculators are provided in the layer of a tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substrations are typically ments are typically ments are typically ments are typically ments are typically processed to the substration of the	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks end Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  The sums iparian qual 100  100%  100%  100%  101  101  102  103  104  105  105  106  107  108  108  108  108  108  108  108	NOTES>> Stream is r encapsulat Culverts 27 Only about reach is ev this form.  Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl >	ted by 7 and 28. t 30 feet of raluated in	

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX	VA	R4SB5	02070010	10/21/2015	02-STR-34			
	CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, ankments, spoil piles, constrictions, livestock  Conditional Category								
	Negligible	Mi	nor		erate	Sev	ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5		
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH	•	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: View downstream toward culverts Bottom Left: View upstream toward culvert



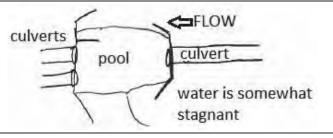
NC DWQ Stream Identification Form Version 4.11

02-STR-34

Date: 10/21/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.689673
Evaluator: K. Astroth	County: Fairfax	Longitude: -77.225862
<b>Total Points:</b> 22.75 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemera Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 9)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1_	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	X	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $\underline{6.5}$ )				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	2	(3)
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles		0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0 Yes = 3			
C. Biology (Subtotal = 7.25)			•	
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	Y	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians		0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		ACW = 0.75	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other method	s. See p. 35 of manua			
Notes: Most of stream is within culverts, only a por	rtion is exposed.	Field Sheet: 04-E	3-STR-16.	

Sketch:



#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor N/A DC2RVA - Area 02 02070010 Name(s) of Evaluator(s) Stream Name and Information 02-STR-35 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Field sheets are Optimal Suboptimal Marginal Poor missing information Low Marginal: High Poor: w Suboptima Non-maintaine lense herbace taken from aerials High Suboptim Lawns, mowed, and maintained Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canop High Marginal Low Poor: Impervious surfaces, mine Riparian areas with tree stratum (dbh > 3 inches) Non-maintained, ense herbaceous vegetation with either a shrub egetation, riparia areas lacking shrub and tree stratum, hay and nearby data areas, nurseries no-till cropland; points. Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and an non-maintained understory. Wetlands resent, with 30% to 60% tree actively grazed pasture, sparsely spoil lands, nuded surfaces Riparian cover and a maintained understory. layer or a tree layer (dbh > 3 inches) present, with <30% tree oroduction, ponds open water. If present, tree stratum (dbh >3 Buffers anopy cover an vegetated non-naintained area row crops, active eed lots, trails, or containing both herbaceous and shrub layers or a areas. recently seeded and stabilized, or ther comparat Recent cutover (dense vegetation). conditions canopy cover. inches) present, with <30% tree non-maintained understory. ther comparat condition. nopy cover wit maintained understory. High Low High Low High Low Condition 0.85 0.75 0.6 0.5 1.5 1.2 1.1 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums . Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 90% 10% 100% Right Bank Score : 0.85 0.6 Cl= (Sum % RA \* Scores\*0.01)/2 % Riparian Area 90% 10% 100% Rt Bank CI > 0.63 CI Left Bank Lt Bank CI > Score > 0.6 0.85 0.63 0.63 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH OTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number THE REACH CONDITION INDEX (RCI) >> 0.32 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF INSERT PHOTOS: DESCRIBE PROPOSED IMPACT:

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date:

02-STR-35

Latitude:

Evaluator:	County: Fairfax		Longitude:	
<b>Total Points:</b> 0 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name:	
·			•	
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence				
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes :	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal =)	_			
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes :	= 3
C. Biology (Subtotal =)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OE	BL = 1.5 Other = 0	)
*perennial streams may also be identified using other methods	. See p. 35 of manua	al.		
Notes: NC data for this resource not available (no f	ield sheets).			
Sketch:				

### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Impact Cowardin Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 02 02070010 10/21/2015 Stream Name and Information Name(s) of Evaluator(s) K. Astroth 02-STR-36 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Marginal Field Sheet: 04-B-STR-Suboptimal Poor 15. High Poor: ow Suboptima ligh Suboptima Riparian areas High Marginal: nse herbaceo Riparian areas with tree stratum (dbh > 3 inches) and maintained Low Poor: with tree stratum (dbh > 3 inches) areas, nurseries Impervious surfaces, mine ense herbaceou riparian areas no-till cropland: to 60% tree present, with vegetation with acking shrub and actively grazed pasture, sparsel vegetated non-Tree stratum (dbh > 3 inches) preser spoil lands. 30% tree canor either a shrub layer or a tree layer (dbh > 3 tree stratum, hay production, ponds Riparian with > 60% tree canopy cover and an non-maintained understory. Wetland nuded surface row crops, active eed lots, trails, or Buffers maintained open water. If areas. containing both maintained area understory inches) present, present, tree herbaceous and shrub layers or a stratum (dbh >3 inches) present, with <30% tree recently seeded other comparable with <30% tree canopy cover. Recent cutove (dense and stabilized, or other comparable condition. conditions non-maintained vegetation). understory canopy cover with maintained High Low High Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 45% 20% 100% Right Bank 0.85 0.5 1.1 Score > CI= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> 55% 30% 15% 100% Rt Bank CI > 0.78 CI Left Bank Lt Bank CI > 0.87 0.83 0.85 0.5 Score > 1.1 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number. THE REACH CONDITION INDEX (RCI) >> 0.42 RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IFINSERT PHOTOS: Typical view of stream



NC DWQ Stream Identification Form Version 4.11

02-STR-36

Date: 10/21/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.683402
Evaluator: K. Astroth	County: Fairfax	Longitude: -77.227333
<b>Total Points:</b> 17.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemera Intermittent Perennial	Other e.g. Quad Name:

Absent	Weak	Moderate	Strong
0	1	2	3
0	1	2	3
	1	2	3
0	1	(2)	3
-	1	7	3
(0)	1	2	3
Ö			3
0	1	2	(3)
0	0.5	1	1.5
0	0.5		1.5
( No	0 = 0	Yes :	= 3
0	1	2	3
0	1	2	3
1.5	1	0.5	0
0	0.5	1	1.5
0	0.5	1	1.5
No	=0	Yes :	= 3
3	2	(1)	0
3	2	7	0
<b>8</b>	1	2	3
(0)	1	2	3
8	0.5	1	1.5
0	0.5	1	1.5
	0.5	1	1.5
0	0.5	1	1.5
	<b>FACW</b> = 0.75	OBL = 1.5 Other = 0	)
See p. 35 of manual			
		d Sheet: 04-STR-1	5.
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 0 5 1 0 0.5 1

		Stre			ment lethodology f		(Fori	n 1)			
					nels classified a				Impact/SAR	Impact	
Project #		Project Name	•	Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R2	02070010	10/21/2015				
Name	e(s) of Evaluate  K. Astroth	tor(s)	Stream Nam	e and Informa		STD 27	7 (Giles R				
Channel C	Condition: Asse	es the cross-sec	tion of the stream	and prevailing of			(Glies R	un)			
. Chamile C					onditional Catego		Po		Sev	oro.	
	Opti	IIIai	Subo	pullial	IVIAI	giriai	TO TO		Sev	ere //	
		Slightly		ew areas of active	Poor. Banks more	less than Severe or stable than Severe	Overwidene Vertically/laterally u	nstable. Likely to	Deeply incised		
Channel Condition	Very little incision of 100% stable bath surface protection prominent (80-1). Stable point bars/ are present. Acce floodplain or fully bankfull benches, and transverse bath 100% stable point bankfull benches.	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars, ars few. Transient	of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	sted banks. Majority able (60-80%). ion or natural rock 80%) AND/OR ures contribute to lkfull and low flow I defined. Stream of floodplains along each. Transient	Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Set temporary/tran instability. Depositiv.	wer bank slopes. esent on 40-60% of tative protection on Streambanks may rout. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Majc are near vertical. E 60-80% of banh protection preser banks, and is insul erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	rosion present on s. Vegetative it on 20-40% of ficient to prevent 60-80% of the d by sediment. prary/transient in uting to instability.	vertical/lateral in incision, flow con banks. Streambe rooting depth, rr vertical/underc protection present c banks, is not pre Obvious bank sk Erosion/raw ban	tained within the bid below average lajority of banks ut. Vegetative no less than 20% of venting erosion. bughing present. ks on 80-100%.	
	sediment depositio		sediment cover	s 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.			AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.		CI
Score	3	}	2	.4	:	2	1.	6	1		2.0
RIPARIA	N BUFFERS: A	Assess both bank				ugh measuremen	ts of length & widt		1		
	Opti	mal		ditional Categorial Ca		ginal	Po		NOTES>> Left bank h	as	
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	- 3 inches) present, inopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, ripanian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	industrial a	rea along	
Condition			High	Low	High	Low	High	Low			
Scores	1.		1.2	1.1	0.85	0.75	0.6	0.5			
escriptors.  Determine squale	arian areas along o quare footage for e Riparian Area and	ach by measurin	g or estimating le	ngth and width. (	Calculators are pr	Ü	Ensure the of % Ri	parian			
Right Bank	% Riparian Area>	40% 0.75	60% 1.5					100%			
•		400/	10%	30%	20%			100%	CI= (Sum % RA * S Rt Bank CI >	cores*0.01)/2 1.20	CI
	% Riparian Area>	40%							Lt Bank CI >		
	% Riparian Area>	0.75	1.5	0.85	0.5				Lt Dalik Ci >	0.81	1.00
Left Bank	Score > M HABITAT: Va	0.75	1.5 zes, water velocit	y and depths; wo		oris; stable substr	ate; low embeded	ness; shade;	NOTES>>	0.81	1.00
Left Bank INSTREAM	Score >	0.75	1.5 zes, water velocit	y and depths; wo	ody and leafy deb	oris; stable substr	ate; low embeded	ness; shade;		0.81	1.00
Left Bank	Score > M HABITAT: Va	0.75 aried substrate si	1.5 zes, water velocitexes, stable feature Subo	y and depths; wo res. Conditiona ptimal	ody and leafy deb	ginal	Po	or		0.81	1.00
Left Bank  INSTREAM ndercut banks;	Score > W HABITAT: Va	0.75  aried substrate si ffle poole comple  mal  re typically present	2 s, water velocit xxes, stable feature Subor Stable habitat eleipresent in 30-50% are adequate fo	y and depths; wo res. Conditiona	Ody and leafy debted and Category  Mar.  Stable habitat elepresent in 10-30% are adequate fo			Dr listed above are stable. Habitat Ily present in less		0.81	1.00

Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX VA		VA	R2	02070010	10/21/2015	02-STR-37		
	ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, poil piles, constrictions, livestock  Conditional Category  Negligible Minor Moderate Severe								
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		0% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5		

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF



Giles Run

02-STR-37 NC DWQ Stream Identification Form Version 4.11 Date: 10/21/2015 Project/Site: DC2RVA - Area 02 Latitude: 38,683310 Evaluator: K. Astroth County: Fairfax Longitude: -77.227237 Total Points: 34.75 Stream Determination (circle one) Other Stream is at least intermittent **Ephemeral Intermittent Perennial** e.g. Quad Name: if ≥ 19 or perennial if ≥ 30\* **Absent** Weak **Moderate** Strong A. Geomorphology (Subtotal = 171<sup>a.</sup> Continuity of channel bed and bank 0 1 3 2. Sinuosity of channel along thalweg 0 1 2 3 3. In-channel structure: ex. riffle-pool, step-pool, 0 1 3 2 ripple-pool sequence 4. Particle size of stream substrate 3 1 0 5. Active/relict floodplain 3 1 3 6. Depositional bars or benches 0 1 7. Recent alluvial deposits 0 1 0 3 8. Headcuts 1 9. Grade control 0.5 1.5 10. Natural valley 0 0.5 1.5 11. Second or greater order channel No = 0Yes = 3artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 6.512. Presence of Baseflow 3 2 0 (1) 13. Iron oxidizing bacteria 0 2 3 14. Leaf litter 1.5 1 0.5 0 15. Sediment on plants or debris 0 0.5 1 1.5 16. Organic debris lines or piles 0.50 1 1.5 17. Soil-based evidence of high water table? No = 0Yes = 3C. Biology (Subtotal = 11.25 18. Fibrous roots in streambed 2 0 19. Rooted upland plants in streambed 0 2 3 20. Macrobenthos (note diversity and abundance) 1 0 3 21. Aquatic Mollusks 1 22. Fish 0.5 1.5 23. Crayfish 0 0.5 1.5 24. Amphibians 0 0.5 1.5 25. Algae 0 0.5 1.5 26. Wetland plants in streambed ACW = 0.75 OBL = 1.5 Other = 0 \*perennial streams may also be identified using other methods. See p. 35 of manual. Notes: Giles Run, no GPS signal, Sunfish madtoms in pool. Field Sheet: 04-B-STR-14. Pideline Clow > Sketch: Sketch: Sand Bar / Beach

		Stre		SSESS fied Stream M			_	,			
Duals - t #		Project Name		wadeable chan	nels classified a			CAD#	Impact/SAR	Impact	
Project #		•		Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A Name	e(s) of Evaluat	2RVA - Area		VA e and Informa	R4SB5	02070010	10/21/2015				
INAITIO	K. Astroth	ior(s)	on earn warn	e and miorma	auon	02-57	ΓR-38				
. Channel C	Condition: Asse	ess the cross-sec	tion of the stream	n and prevailing co	ondition (erosion,		11.00				
				C	onditional Categor		Po	or	Sev	/ere	
			Optimal Suboptimal		1	less than Severe or	Overwiden	5	1	5	
Channel Condition	Very little incision or 100% stable ban surface protection prominent (80-11 Stable point bars) are present. Acce floodplain or fully bankfull benches. and transverse ba sediment depositio	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches sas to their original of developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to or newly develope portions of the r	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, di floodplains along reach. Transient	Poor. Banks more or Poor due to lo Erosion may be pri both banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sec temporary/traninstability. Depositic stability, may be	stable than Severe wer bank slopes. esent on 40-60% of lative protection on Streambanks may creut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	Vertically/laterally widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/Of stream is covere Sediment is temp nature, and contrit AND/OR V-shapp	unstable. Likely to ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. orary/transient in oration or instability. de channels have	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious banks le Erosion/raw ban		
	10% of I			rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.		AND/OR Aggrading channel. Greate than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.		c
Score	3	3	2	.4	:	2	1.	6	1	1	2.
. RIPARIAN	N BUFFERS: A	Assess both bank	's 100 foot riparia	an areas along the	e entire SAR. (rou	ugh measuremen	ts of length & wid	h may be accep	table)		
. RIPARIAN	N BUFFERS: A		Con	an areas along the ditional Categorimal	gory	ginal	ts of length & wid		table)		
RIPARIAN Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	imal  3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained					
Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca	imal  3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Catece ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti  Tree stratum (dbh > with > 60% tree ca	imal 3 inches) present, anopy cover and a derstory. Wellands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Categ ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  Delineate ripa escriptors. Determine squelow.	Opti Tree stratum (dbh > with > 60% tree ca non-maintained unclocated within the	imal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorium Low Suboptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate ripa escriptors. Determine squelow.	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	imal 3 inches) present, anopy cover and a deterstory. Wellands e riparian areas.  5 each stream band ach by measurin Score for each rice 60%	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 25%	ditional Categorium Low Suboptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Con the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate ripatescriptors. Determine squelow.	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the	imal  - 3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5  each stream banl aach by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating leparian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutore (dense vegetation).  Low  1.1  Categories and Co ongth and width. Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100		cores*0.011//2	
Riparian Buffers  Condition Scores  Delineate ripatescriptors. Determine squelow.	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	imal 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream bani ach by measurin Score for each ri 60% 0.75 60%	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. Co n the blocks belov  15%  0.85	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	0.70	C
Riparian Buffers  Condition Scores  Delineate ripa escriptors. Determine squelow. Enter the % F Right Bank	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	simal  3 inches) present, anopy cover and a laterstory. Wellands e riparian areas.  5  each stream bani ach by measurin 60% 0.75  60% 0.75	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 25% 0.5	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are proven.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, traits, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >		C. 0.7
Riparian Buffers  Condition Scores  Delineate ripalescriptors Determine squelow Enter the % F Right Bank  Left Bank  B. INSTREAN	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	simal  3 inches) present, anopy cover and a derstory. Wetlands er liparian areas.  5  each stream bani ach by measurin  Score for each ri  60%  0.75  60%  0.75  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.5  25% 0.5  zes, water velocii	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. Co n the blocks belov  15% 0.85  ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are proven.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, traits, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	0.70	
Riparian Buffers  Condition Scores  Delineate ripalescriptors Determine squelow Enter the % F Right Bank  Left Bank  B. INSTREAN	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands er liparian areas.  5  ach by measurin  60%  0.75  60%  0.75  aried substrate si iffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.5  25% 0.5  zes, water velocit exes, stable featu	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Acalculators are proved the control of the cont	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	0.70	
Riparian Buffers  Condition Scores  Delineate ripe lescriptors. Determine squelow. Enter the % F Right Bank  Left Bank  B. INSTREAN undercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	imal  3 inches) present, anopy cover and a derstory. Weltands e riparian areas.  5  each stream bani ach by measurin  Score for each ri  60%  0.75  60%  0.75  aried substrate si fffle poole comples	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.5  25% 0.5  zes, water velocit exes, stable featu  Subo  Stable habitat ele	ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. Co n the blocks belov 15% 0.85  ty and depths; wo res.  Conditiona ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85 Indition Scores us Calculators are prov.  Calculators are prov.  Il Category  Marginal Marginal Category  Marginal Marginal Category  Marginal Marginal Category	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to f % R Blocks end	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	0.70	
Riparian Buffers  Condition Scores  Delineate ripalescriptors Determine squelow Enter the % F Right Bank  Left Bank  Left Bank  Instream	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands er liparian areas.  5  ach stream bank ach by measurin 60% 0.75  60% 0.75  aried substrate si fifte poole completimal re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 25% 0.5  25% 0.5  Zes, water velocitixes, stable features suboptimes stable features suboptimes	ditional Categoritimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  pris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >  NOTES>>	0.70	

	St	ream In	npact A	ssessm	ent For	m Page	2		
Project #	Applicant	Locality Cowardin Class. HUC		Date	Date Data Point		Impact Factor		
N/A	CSX V			R4SB5	02070010	10/21/2015	02-STR-38		
	ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, conc	rete, gabions, or		straightening of ch	hannel, channeliz	ation,	NOTES>>	
	Negligible	Mi	nor		erate	Sev	ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		of the channel in the parameter PR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5		
	REACH C	ONDITION II	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH		
OTE: The CIs and R	CI should be rounded to 2 decimal places. T	The CR should be roun	ded to a whole number	er.			THE REACH	CONDITION IN	DEX (RCI) >>
							RC	I= (Sum of all C	l's)/5

### INSERT PHOTOS:



Top Left: View upstream at culvert under railroad Bottom Right: Typical view of stream away from railroad

CR = RCI X LF X IF

COMPENSATION REQUIREMENT (CR) >>

0



NC DWQ Stream Identification Form Version 4.11

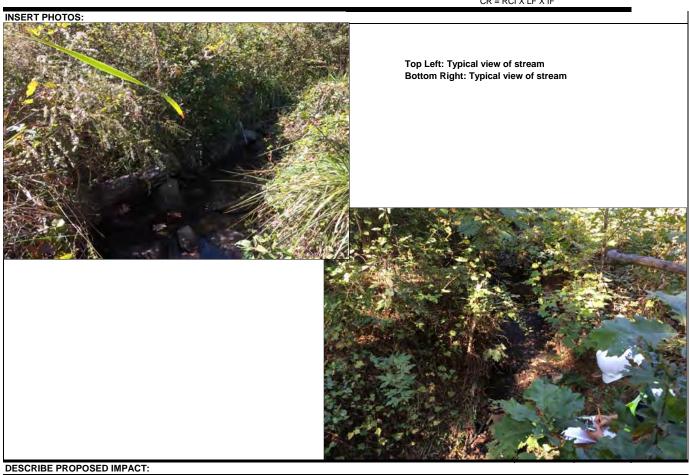
02-STR-38

Date: 10/21/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.682241
Evaluator: K. Astroth	County: Fairfax	Longitude: -77.227461
<b>Total Points:</b> 24.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemera Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 13	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3	
2. Sinuosity of channel along thalweg	0	(1)	2	3	
3. In-channel structure: ex. riffle-pool, step-pool,	0	$\overline{\bigcirc}$	2	3	
ripple-pool sequence					
4. Particle size of stream substrate	0		(2)	3	
5. Active/relict floodplain	0	(1)	X	3	
6. Depositional bars or benches	0	1	(2)	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0		2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	$\bigcirc 0.5$	1	1.5	
11. Second or greater order channel	( No	0 = 0	Yes:	= 3	
a artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = <u>5.5</u> )					
12. Presence of Baseflow	0	(1)	2	3	
13. Iron oxidizing bacteria	0	<del></del>	(2)	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	(1)	1.5	
16. Organic debris lines or piles	0	0.5		1.5	
17. Soil-based evidence of high water table?	No	0 = 0	Yes = 3		
C. Biology (Subtotal = 6			•		
18. Fibrous roots in streambed	3	(2)	1	0	
19. Rooted upland plants in streambed	(3)	2	1	0	
20. Macrobenthos (note diversity and abundance)	7	(1)	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish		0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	7	0.5	1	1.5	
25. Algae	8	0.5	1	1.5	
26. Wetland plants in streambed			OBL = 1.5 Other = 0		
*perennial streams may also be identified using other methods	S. See p. 35 of manua				
Notes: Field Sheet: 04-B-STR-13.					
10.0007 1 10.10 0.10011 0 1 2 0 1 1 1 1 1 1 1 1 1 1 1 1 1					
small pool	built up FLOW drive				
steep	in junk car lot				

		Stre			ment lethodology f		(Fori	m 1)			
					nels classified a				Impact/SAR	Impact	
Project #	ı	Project Name	•	Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A		2RVA - Area		VA	R4SB3	02070010	10/21/2015				
Nam	e(s) of Evaluat K. Astroth	tor(s)	Stream Nam	e and Informa	ation	02-S1	FD 20				
Channal C		4b	4: <b>f</b> 4b4				K-39				
. Channel C	ondition: Asse			C	onditional Catego	ry					
	Opti	mai	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	1	MAN AND AND AND AND AND AND AND AND AND A		ew areas of active	Poor. Banks more	less than Severe or stable than Severe	Overwidene Vertically/laterally u	ınstable. Likely to	Deeply incised		
Channel Condition	Very little incision or 100% stable bar surface protectior prominent (80-1) Stable point bars/, are present. Acce floodplain or fully bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 20%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars, ars few. Transient	of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock .80%) AND/OR ures contribute to .kfull and low flow II defined. Stream o bankfull benches, d floodplains along each. Transient	Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Set temporary/tran instability. Depositiv.	wer bank slopes. esent on 40-60% of tative protection on Streambanks may yrout. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Majc are near vertical. E 60-80% of banh protection preser banks, and is insul erosion. AND/OF stream is covere Sediment is tempo nature, and contrib AND/OR V-shape	rosion present on as. Vegetative on 20-40% of fficient to prevent a 60-80% of the d by sediment. orary/transient in uting to instability.	vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious bank ske Erosion/raw bank	stability. Severe tained within the do below average hajority of banks ut. Vegetative on less than 20% of eventing erosion. Doughing present. ks on 80-100%.	
	sediment depositio 10% of I		sediment cover	s 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.		e AND/OR Aggrading channel. Gre		CI
Score	3	1	2	.4	;	2	1.	6	1		2.0
NOTES>>				Fi	eld Sheet:	04-B-STR-1	12.				
RIPARIAN	N BUFFERS: A	ssess hoth hank	r's 100 foot rinaria	in areas along the	entire SAR (ro	idh measiiremen	ts of length & widt	h may he accen	table)		
,	1 2011 2110. 7	oscos both barn		ditional Cate		agn meadaremen	to or longer & wat	Timay be decep	NOTES>>		
	Opti	mal		ptimal		ginal	Po	or			
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	nopy cover and a	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed	Low Poor: Impervious surfaces, mine spoil lands,			
	Todalog Main an	e riparian areas.	containing both herbaceous and shrub layers or a non-maintained understory.	maintained understory. Recent cutover (dense vegetation).	layer (dbh > 3 inches) present, with <30% tree canopy cover.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
			containing both herbaceous and shrub layers or a non-maintained	understory. Recent cutover (dense	inches) present, with <30% tree	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with	vegetated non- maintained area, recently seeded and stabilized, or other comparable	surfaces, row crops, active feed lots, trails, or other comparable			
Condition Scores	1.	e riparian areas.	containing both herbaceous and shrub layers or a non-maintained understory.	understory. Recent cutover (dense vegetation).	inches) present, with <30% tree canopy cover.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Scores  Delineate ripalescriptors. Determine scelow.		5  ach stream ban ach by measurin	containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C	understory, Recent cutover (dense vegetation).  Low 1.1  attegories and Co	inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Scores  Delineate ripa escriptors. Determine so elow. Enter the % F	arian areas along equare footage for e	5 sach stream ban ach by measurin Score for each r 60%	containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating lesiparian category in 20%	understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Congth and width. Congth blocks below 20%	inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Scores  Delineate ripa escriptors. Determine so elow. Enter the % F	1. arian areas along e uuare footage for e Riparian Area and	5 seach stream ban ach by measurin	containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le iparian category in	understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Congth and width. Congth and width. Congth and width. Congth and blocks below	inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums parian qual 100	Cl≕ (Sum % RA * S	cores*0.01)/2	
Scores  Delineate ripa escriptors. Determine so elow. Enter the % F	1. arian areas along of the Riparian Area and % Riparian Area > Score >	5  beach stream ban ach by measurin 60% 0.85 60%	containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 20% 0.75	understory. Recent cutover (dense vegetation).  Low 1.1  ategories and Congth and width. Conthe blocks below 20% 0.5	inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums parian qual 100	CI= (Sum % RA * S Rt Bank CI >	0.76	CI
Scores  Delineate rips escriptors. Determine so elow. Enter the % f  Right Bank  Left Bank	arian areas along equare footage for e Riparian Area and % Riparian Area> Score >	5 seach stream ban ach by measurin 60% 0.85	containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating lest parian category in 20% 0.75	understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Congth and width. Congth and width. Congth and width. Congth and Cong	inches) present, with <30% tree canopy cover.  High 0.85  Indition Scores us Calculators are prov.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % Ri Blocks ec	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100 100%	Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >		CI 0.69
Delineate ripe escriptors. Determine so elow. Enter the % F Right Bank	1. arian areas along of the Riparian Area and % Riparian Area > Score >	5  beach stream ban ach by measurin 60% 0.85  60% 0.5  arried substrate si	containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 20% 0.75  20% 0.85  izes, water velocities and interest of the service	understory. Recent cutover (dense vegetation).  Low 1.1  attegories and Coungth and width. Coungth and width	inches) present, with <30% tree canopy cover.  High 0.85  Indition Scores us Calculators are prov.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % Ri Blocks ec	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100 100%	CI= (Sum % RA * S Rt Bank CI >	0.76	
Scores  Delineate ripe escriptors. Determine scelow. Enter the % F Right Bank  Left Bank  INSTREAL	1. arian areas along of puare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Varoot mats; SAV; ri	5  seach stream ban ach by measurin 60% 0.85  60% 0.5  aried substrate siffle poole comple	containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.75  20% 0.85	understory, Recent cutover (dense vegetation).  Low 1.1  ategories and Congth and width. (on the blocks below 20% 0.5  20% 0.75  y and depths; wores. Conditional	inches) present, with <30% tree canopy cover.  High  0.85 Indition Scores us Calculators are prov.  ody and leafy detail Category	open water. If present, tree stratum (dbh >3 inches) present, with valow free canopy cover with maintained understory.  Low  0.75  sing the ovided for you	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % Ri  Blocks ec	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%  100%	Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	0.76	
Scores  Delineate ripe escriptors. Determine so elow. Enter the % f Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/	1.  Arian areas along of the properties of the p	5  seach stream ban ach by measurin 60% 0.85  60% 0.5  aried substrate siffle poole comple	containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating lest parian category in 20% 0.75  20% 0.85  izes, water velocitiexes, stable feature.  Subool Stable habitat elei	understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Congth and width. Congth and width. Congth and width. Congth and congth and depths; wo res.  Conditional ments are typically ments are typically	inches) present, with <a href="https://www.ncbes.com/scores-us/calculators-are-prov.">https://www.ncbes.com/scores-us/calculators-are-prov.</a> Calculators are prov.  Calculators are prov.  Calculators are prov.  Calculators are prov.  Stable habitat ele	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks econds area, recently area, and the seeded and stabilized, or other comparable condition.	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums parian qual 100 100%  100%  or iness; shade;	Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	0.76	
Scores  Delineate rips escriptors. Determine so eleow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks;	1. arian areas along of puare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Varoot mats; SAV; ri	5  seach stream ban ach by measurin 60% 0.85  60% 0.5 aried substrate si ffle poole comple mal	containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 20% 0.75  20% 0.85  izes, water velocit exes, stable feature stable habitat ele present in 30-509 are adequate fo	understory, Recent cutover (dense vegetation).  Low  1.1  ategories and Congth and width. Congth and width. Congth and depths; wores.  Conditional	inches) present, with <a href="https://www.ncbes.com/scores-us/calculators-are-prov.">https://www.ncbes.com/scores-us/calculators-are-prov.</a> Calculators are prov.  Il Category  Mar.  Stable habitat ele present in 10-30% are adequate fo	open water. If present, tree stratum (dbh >3 inches) present, with +30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % Ri Blocks ed  ate; low embeded	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100 100%  100%  ilisted above are stable. Habitat lily present in less	CI= (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>>	0.76	

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date Data Point		SAR length	Impact Factor
N/A	CSX		VA	R4SB3	02070010	10/21/2015	02-STR-39		
	L ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of cl	hannel, channeliz	ation,	NOTES>> Within culv	rost under
	·		Conditiona	I Category					
	Negligible	Mir	nor	Mod	erate	Sev	ere	pipe ROW.	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		of the channel in the parameter PR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5		
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH		
OTE: The Cls and F	RCI should be rounded to 2 decimal places.	The CR should be roun	ided to a whole number	er.			THE REACH	CONDITION INI	DEX (RCI) >>
							RC	I= (Sum of all C	l's)/5
							COMPENSAT	ION REQUIREN	MENT (CR) >>
							CR = RC	XLFXIF	



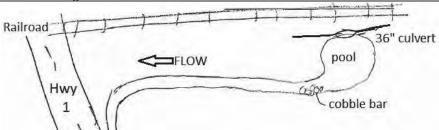
**NC DWQ Stream Identification Form Version 4.11** 

02-STR-39

Date: 10/21/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.678625
Evaluator: K. Astroth	County: Fairfax	Longitude: -77.2283508
<b>Total Points:</b> 25.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemera Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 13	Absent	Weak	Moderate	Strong
a. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
B. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
. Particle size of stream substrate	0	1	2	3
i. Active/relict floodplain	0	(1)	<b>Y</b>	3
5. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	2	3
B. Headcuts	0	1	2	3
. Grade control	0	0.5	1	1.5
0. Natural valley	0	0.5	1	1.5
Second or greater order channel	( No	0 = 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual 3. Hydrology (Subtotal = $5.5$ )				
2. Presence of Baseflow	0	1	2	3
3. Iron oxidizing bacteria	0	(1)	2	3
4. Leaf litter	1.5	1	0.5	0
5. Sediment on plants or debris	0	0.5	(1)	1.5
6. Organic debris lines or piles	0	0.5	1	1.5
7. Soil-based evidence of high water table?	( No	0 = 0	Yes:	= 3
C. Biology (Subtotal = $\frac{7.25}{}$ )				
8. Fibrous roots in streambed	3	(2)	1	0
9. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	Y	(1)	2	3
1. Aquatic Mollusks	0	1	2	3
2. Fish	0	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
4. Amphibians	0	0.5	1	1.5
5. Algae	0	0.5	1	1.5
6. Wetland plants in streambed		FACW = 0.75	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other method				
Notes: Runs parallel to tracks for portion of reacl	h then turns and ru	ns within road di	tch along Hwy 1. Ve	ery little

Sketch:



## **Ephemeral Stream Assessment Form (Form 1a)**

Unified Stream Methodology for use in Virginia

For	use in	ephemeral	streams

Project #	Project Name	Locality Cowardin Class.		HUC	HUC Date		Impact/SAR length	Impact Factor
N/A	DC2RVA - Area 02	VA	R6	02070010	07/21/2016			1

Name(s) of Evaluator(s) Stream Name and Information

L. Postaski, R. Mangum 02-STR-40

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Cor	nditional Cate	gory				NOTES>>Ch	annel
	Optimal	Subo	ptimal	Mar	ginal	Po	oor	parallels tra	icks, poor
Riparian Buffers	Tree stratum (dbh > 3 inches) presen with > 60% tree canopy cover and ar non-maintained understory. Wetland areas.	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60%	3 inches) present, with >30% tree canopy cover and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ponds, open water. If present, tree	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious	Field Sheet 01. cces, tive s, or able	riparian Illast edge.
		High	Low	High	Low	High	Low		
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5		
. Delineate ripa	arian areas along each stream ban	k into Condition Cat	tegories and Cond	lition Scores using	the descriptors.	Ensure	he sums		
·	uare footage for each by measurin		,	culators are provid	led for you below.		tiparian qual 100		
	% Riparian Area> 100%						100%		
Right Bank	Score > <b>0.85</b>						.5070		
								CI= (Sum % RA * S	cores*0.01)/2
Latin David	% Riparian Area> 90%	10%					100%	Rt Bank CI >	0.85
Left Bank	Score > 0.6	0.85						Lt Bank CI >	0.63

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.37

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



Concrete culvert associated with stream.

NC DWQ Stream Identification Form Version 4.11

02-STR-40

Date: 07/21/2016	Project/Site: DC2RVA - Area 02	Latitude: 38.674332
Evaluator: L. Postaski, R. Mangum	County: Fairfax	Longitude: -77.230679
<b>Total Points:</b> 15 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

if $\geq$ 19 or perennial if $\geq$ 30*	Ephlemeral	innittent referm	e.y. Quad Name.	•
A Coomorphology (Subtotal 8	Absent	Weak	Moderate	Strong
A. Geomorphology (Subtotal = 8 )  1 <sup>a.</sup> Continuity of channel bed and bank	Absent 0	(1)	2	3
Sinuosity of channel along thalweg	0	$\overline{}$	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel		<b>0</b> = <b>0</b>	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 3				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
C. Biology (Subtotal = $\underline{4}$ )				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
				1

0.5

(0.5)

1

1

FACW = 0.75; OBL = 1.5 Other = 0

\*perennial streams may also be identified using other methods. See p. 35 of manual.

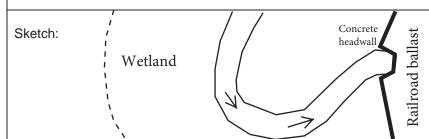
Notes: Standing water in channel, low flow. Field Sheet: 4-B-STR-01.

23. Crayfish

25. Algae

24. Amphibians

26. Wetland plants in streambed





1.5

1.5

1.5

0

0

		Stre			sment Methodology f		(For	m 1)			
					nels classified a						
Project #		Project Name	)	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	02	VA	R4SB	02070010	10/21/2015				
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation	•					
	K. Astroth					02-S	ΓR-41				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream		ondition (erosion,						
	Opt	mal	Subo	ptimal		ginal	Po	or	Sev	ere	
	1	مويد هملاي	1		Often incised, but less than Severe or		Overwidene	ed/incised.	1	5	
Channel Condition	Very little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient		100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches re present. Access to their original floodplain or fully developed wide lankfull benches. Mid-channel bars, and transverse bars few. Transient			Poor. Banks more stable than Severe or Poor due to lower bank slopes. Terosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute		unstable. Likely to ority of both banks irrosion present on orks. Vegetative int on 20-40% of fficient to prevent & 60-80% of the db y sediment. orary/transient in outing to instability.	Deeply incised vertical/lateral incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sk Erosion/raw ban	stability. Severe tained within the d below average ajority of banks ut. Vegetative n less than 20% of venting erosion. ughing present.	
	codiment deposition covers less than			ent deposition covers less than 10% of bottom.  District Sediment covers 10-40% of the stream bottom.  AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.				ed channels have on is present on > aks and stable sition is absent.	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	channel. Greater bed is covered by uting to instability. hannels and/or	CI
Score	3 2.4				:	2	1.	6	1		2.4
NOTES>>	I DIJEEEDS.	A b - 4b - b b	d- 400 f4		eld Sheet:				4-1-1		
Z. KIFAKIAI	N BUFFERS: /	Assess Doth Dank	•	ditional Cate	· · ·	ugn measuremen	ts or length & wiat	n may be accep			
	Opt	mal		ptimal		ginal	Po	or	NOTES>> Majority of	reach	
Riparian Buffers	Tree stratum (dbh:	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a href="#">400%</a> tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, traits, or other comparable conditions.	flows throu culvert und pipeline RC has minima layer.	igh a ler DW. ROW	
			High	Low	High	Low	High	Low			
Condition Scores	1.	5	1.2	1.1	0.85	0.75	0.6	0.5			
descriptors. 2. Determine so pelow.	arian areas along juare footage for e Riparian Area and	ach by measurin	g or estimating le	ngth and width. (	Calculators are pr		Ensure the of % R	iparian qual 100			
Right Bank	% Riparian Area>	20%	25%	30%	25%			100%			
	Score >	0.5	0.75	1.1	0.85				CI= (Sum % RA * So	cores*0.01)/2	
Left Bank	% Riparian Area>	20%	25%	30%	25%			100%	Rt Bank CI >	0.83	CI
	Score >	0.5	0.75	1.1	0.85				Lt Bank CI >	0.83	0.83
	M HABITAT: Va root mats; SAV; r				ody and leafy deb	oris; stable substr	ate; low embeded	ness; shade;	NOTES>>		
Instream	Opt		1	Conditiona		ginal	Po	or			
Habitat/		re typically present	Stable habitat eler present in 30-50%	ments are typically % of the reach and	Stable habitat ele present in 10-30%	ments are typically % of the reach and	Habitat elements lacking or are un	listed above are stable. Habitat	•		
Available	54 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	00/ -44									
Cover	in greater than 5			r maintenance of ations.		ations.	elements are typica than 10% of <b>0.</b>	the reach.			CI 0.90

Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	1
N/A	CSX		VA	R4SB	02070010	10/21/2015	02-STR-41			l
	L ALTERATION: Stream crossi spoil piles, constrictions, livestock	ings, riprap, conc			traightening of ch	nannel, channeliza	ation,	NOTES>>	vert under	Ĭ
	March 19		Conditiona					pipe ROW.		i
	Negligible	Mii	nor	Mode		Sev	Severe pipe ROW.			ı
Channel Alteration	or hardening absent. Stream has an unaltered pattern or has naturalized.	the parameter guidelines.	the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8t disrupted by any alterations listed i guidelines AND/O shored with gat cem	of the channel in the parameter PR 80% of banks bion, riprap, or ent.			CI
SCORE	1.5	1.3	1.1	0.9	0.7	0.				0.70
	REACH CO	ONDITION II	NDEX and S	TREAM CON	IDITION UN	ITS FOR TH	IS REACH			i
OTE: The Cls and P	RCI should be rounded to 2 decimal places. T	he CR should be roun	ided to a whole number	er.	·		THE REACH	CONDITION IND	DEX (RCI) >>	
								I= (Sum of all C		
					ŀ	(		ION REQUIREN	IENT (CR) >>	0
							CR = RC	XLFXIF		





Top Left: View of pooled portion of stream between rairoad and pipeline ROW Top Right: View of pipeline ROW from railroad Bottom Left: View of blocked railroad culvert

NC DWQ Stream Identification Form Version 4.11

02-STR-41

Date: 10/21/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.673911
Evaluator: K. Astroth	County: Prince William	Longitude: -77.230472
<b>Total Points:</b> $28.25$ Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemera Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 12)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	( N	o = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $9.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1)	1.5
16. Organic debris lines or piles	0	0.5	① _	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	= 3
C. Biology (Subtotal = $6.75$	•			
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	Y	0
20. Macrobenthos (note diversity and abundance)	Y	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other methods	. See p. 35 of manua			

Notes: Stream originates at culvert below ballast & flows through culvert under Pipeline ROW to the east, continuing out of the study area. Culvert by tracks is clogged & pools water. Culvert on east side of pipeline ROW expels

Sketch:

wetland

pool

Pipeline

ROW

wetland

fence

Office

Trailer

FLOW

shed

little water. Water seeps into stream from under pipeline ROW from around culverts.

(04-B-STR-11)

		Stre					(For	m 1)						
				fied Stream N wadeable chan										
Project #	F	Project Name	)	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor				
N/A		2RVA - Area		VA	R4SB	02070010	10/20/2015							
	e(s) of Evaluat	or(s)	Stream Nam	e and Informa	ation	00.07	FD 42							
	K. Astroth	es the cross see	tion of the stream	and provailing o	andition (arasian	02-S	K-42							
. Chamilei C	Opti				Conditional Catego		Po	or	Sev	(ATA)				
		معريد	1		Often incised, but less than Severe or		Overwidene	ed/incised.	1	5				
Channel Condition	100% Stable ballks. Vegetative		egetative vegetative protection or natural rock, AND/OR benches eir original ped wide annel bars, likely has access to bankfull and low flow channels are well defined. Stream portions of the reach. Transient is less than			stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present. de channels have	Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have		incision, flow cor banks. Streambi rooting depth, n vertical/underc protection present of banks, is not pre Obvious bank sli Erosion/raw bar AND/OR Aggradin	stability. Severe itained within the id below average iajority of banks ut. Vegetative on less than 20% of iventing erosion. bughing present.				
	10% of bottom.			10% of bottom.			bottom.	banks and deposit	on on > 40% of the ional features which to stability.	40% of the ban sediment depos		deposition, contrib Multiple thread subterrar	uting to instability. channels and/or	CI
Score	3	i	2	.4		2	1.	6			2.4			
NOTES>>				Fi	eld Sheet:	04-B-STR-1	10.							
. RIPARIAI	N BUFFERS: A	ssess both bank		an areas along the	,	ugh measuremen	ts of length & widt	h may be accep	ntable)					
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or	Railroad a	nd ballast				
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	nopy cover and a lerstory. Wetlands	to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		y of reach				
			High	Low	High	Low	High	Low						
Condition Scores	1.5	5	1.2	1.1	0.85	0.75	0.6	0.5	]					
escriptors Determine so elow.	arian areas along e quare footage for ea Riparian Area and s	ach by measurin	g or estimating le	ngth and width. (	Calculators are pr		Ensure the of % Ri	iparian						
Right Bank	% Riparian Area>	10% 0.75	90% 1.2					100%						
Left Bank	% Riparian Area>	50%	50%					100%	CI= (Sum % RA * S Rt Bank CI >	cores*0.01)/2	CI			
	Score >	0.6	0.75						Lt Bank CI >	0.68	0.92			
	M HABITAT: Va ; root mats; SAV; rit			res.		oris; stable substr	ate; low embeded	ness; shade;	NOTES>>					
Instream	Onti	mal	Subo		al Category	ginal	Po	or	-					
	Орш	Optimal Suboptimal		Stable habitat ele	ments are typically	Poor  Habitat elements listed above are lacking or are unstable. Habitat		Habitat elements listed above are						
Habitat/ Available			present in 30-509		present in 10-309									
	Habitat elements ar in greater than 50	0% of the reach.	present in 30-50% are adequate fo popul	% of the reach and r maintenance of ations.	are adequate fo popul	% of the reach and r maintenance of ations.	lacking or are un elements are typica than 10% of 0.	ally present in less the reach.			CI 0.9			

	St	ream Im	pact A	ssessm	ent For	m Page	e 2										
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor								
N/A	CSX		VA	R4SB	02070010	10/20/2015	02-STR-42										
	L ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, conc	rete, gabions, or		straightening of ch	hannel, channeliz	ation,	NOTES>> Originates									
	Negligible	Mir	nor	Mode	erate	Severe 18 under railroad.					Severe		Severe		Severe		aiiroad.
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	,											
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5										
	REACH C	ONDITION IN	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH										

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

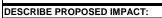
INSERT PHOTOS:



Top Left: View upstream at culvert under railroad

Bottom Right: Typical view of stream running parallel to the railroad





NC DWO Stream Identification Form Version 4.11

02-STR-42

Date: 10/20/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.671830
Evaluator: K. Astroth	County: Prince William	Longitude: -77.233498
<b>Total Points:</b> 25.75 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemera Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 11)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	<b>M</b>	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $\frac{7.5}{}$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	(0)
15. Sediment on plants or debris	0	0.5	1	1.5
10.0		25	4	4.5

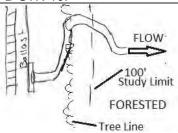
16. Organic debris lines or piles 1.5 17. Soil-based evidence of high water table? No = 0Yes = 3 C. Biology (Subtotal - 7.25)

C. Biology (Subtotal = 1.25 )			_	
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	7	0
20. Macrobenthos (note diversity and abundance)	Ŷ	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75, (	OBL = 1.5 Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Originates at culvert. Flows through wetland area. Runs parallel to tracks within study area. Field Sheet: 04-B-STR-10.

Sketch:



		Otic		SSESS fied Stream M			_	,			
				wadeable chan	nels classified a				Impact/SAR	Impact	
Project #		Project Name	•	Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A		2RVA - Area		VA	R4SB	02070010	10/20/2015				
Nam	e(s) of Evaluation	( )		e and Informa	ation	02-61	ΓR-43				
. Channel (	Condition: Asse	ess the cross-sec	tion of the stream	and prevailing or	andition (erosion		11/-43				
	Opti				onditional Categor		Po	or	Sev	vor o	
	У	IIIIai	Jubo	pumai	Iviai	giriai	W.			//	
		- MAR	1			less than Severe or	Overwiden		1	5	
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully	n or natural rock, 00%). AND/OR bankfull benches ess to their original developed wide	erosion or unproter of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches,	or Poor due to lo Erosion may be pre both banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sec	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient. contribute	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment.	Deeply incised vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present to banks, is not pre Obvious bank sla	stability. Severe itained within the ad below average itajority of banks ut. Vegetative on less than 20% of eventing erosion.	
	bankfull benches. and transverse ba sediment depositio 10% of	ars few. Transient on covers less than	or newly develope portions of the r sediment cover	d floodplains along reach. Transient rs 10-40% of the bottom.	stability, may be AND/OR V-shape vegetative protection banks and deposition	on that contribute to forming/present. ed channels have ion on > 40% of the ional features which to stability.	nature, and contrit AND/OR V-shape vegetative protecti 40% of the bar sediment depos	outing to instability. ed channels have on is present on > hks and stable	Erosion/raw bar AND/OR Aggradin than 80% of strean deposition, contrib Multiple thread subterran	ks on 80-100%. g channel. Greater bed is covered by uting to instability. channels and/or	c
Score	3	3	2	.4	2	2	1.	6	1	1	2.
. RIPARIAI	N BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (rou	ugh measuremen	ts of length & wid	th may be accep	table)		
2. RIPARIAI	N BUFFERS: A		Con	an areas along the ditional Categ ptimal	gory	ginal	ts of length & wid		notes>>		
Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with					
Riparian	Opti Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed or other comparable conditions.			
Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	imal  3 inches) present, anopy cover and a defestory. Wellands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian Buffers  Condition Scores  Delineate riplescriptors. Determine solution.	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located within the located areas along a quare footage for e	imal  3 inches) present, enopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorian Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow.	Tree stratum (dbh with > 60% tree canon-maintained und located within the located within	imal  3 inches) present, anopy cover and a deferstory. Weltands e riparian areas.  5.5  each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in	ditional Categories and Congth and width. Categories and Congth and width. Categories and with the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are proven.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100			
Riparian Buffers  Condition Scores  Delineate riplescriptors. 2. Determine so	Tree stratum (dbh with > 60% tree canon-maintained und located within the located within	imal  3 inches) present, enopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorian Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>		
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine scelow. Enter the % Right Bank	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wellands e riparian areas.  5  each stream ban each by measurin Score for each ri 15% 0.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.6	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. ( In the blocks below 15% 0.75	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prov. 60%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%			
Riparian Buffers  Condition Scores  Delineate rip lescriptors. Determine scelow.	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wellands e riparian areas.  5  each stream ban each stream ban each by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in 10%	ditional Categorium I  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and County and County and County and County and County (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prov. 60%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100	NOTES>>  Cl= (Sum % RA * S	cores*0.01)/2 0.91 0.76	C 0.8
Riparian Buffers  Condition Scores  Delineate rip lescriptors. Determine scoelow. Right Bank  Left Bank  B. INSTREAL	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	5  seach stream ban lach by measurin 15% 0.5  40% 0.6  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.6  40% 0.75  Zes, water velocii	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. (c) the blocks below 15% 0.75  20% 1.1  ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are prov. 60% 1.1	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	0.91	
Condition Scores  Delineate rip lescriptors. Descriptors. Enter the % Right Bank  Left Bank  Left Bank  INSTREAL	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	5  seach stream ban lach by measurin 15% 0.5  40% 0.6  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.6  40% 0.75  Zes, water velocii	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. (c) the blocks below 15% 0.75  20% 1.1  ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Acalculators are prov. 60%  1.1	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks ed	Low Poor: Impervious provided in the sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	0.91	
Condition Scores  Delineate rip lescriptors. Descriptors. Ender the % Right Bank  Left Bank  Left Bank  Instream Habitat/	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands er fiparian areas.  5  each stream ban each by measurin  Score for each ri  15%  0.5  40%  0.6  aried substrate si ifftle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.6  40% 0.75  Zes, water velocit exes, stable featu	ditional Categoritimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (congth and width. (cong	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  pris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	0.91	
Condition Scores  Delineate rip elescriptors. Determine scoelow. Enter the % Right Bank  Left Bank  Left Bank  Instream Habitat/ Available	Tree stratum (dbh > with > 60% tree cc conon-maintained unclocated within the located wit	imal  3 inches) present, anopy cover and a derstory. Wetlands er fiparian areas.  5  each stream ban each by measurin  Score for each ri  15%  0.5  40%  0.6  aried substrate si fiftle poole completimal  re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.6  40% 0.75  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Acalculators are prov. 60% 1.1  Category Marginal Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed older conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	0.91	3.0
Condition Scores  Delineate rip lescriptors. Descriptors. Ender the % Right Bank  Left Bank  Left Bank  Instream Habitat/	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands er iparian areas.  5  each stream ban each by measurin  15%  0.5  40%  0.6  aried substrate si iffle poole completimal  re typically present 0% of the reach.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.6  40% 0.75  Zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and cong	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85 Indition Scores us Calculators are prov. 60% 1.1  Category Marginal Category Stable habitat eleipresent in 10-30% are adequate for popul	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically % of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks ended to the blocks ended	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  he sums iparian qual 100  100%  100%  Iness; shade;	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	0.91	

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB	02070010	10/20/2015	02-STR-43		
	_ ALTERATION: Stream cross poil piles, constrictions, livestock Negligible			al Category	straightening of ch		ation,	NOTES>>	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		of the channel in the parameter PR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5	1	

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



Typical view of roadside ditch stream, view upstream toward railroad

NC DWO Stream Identification Form Version 4.11

02-STR-43

Date: 10/20/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.671068
Evaluator: K. Astroth	County: Prince William	Longitude: -77.234530
<b>Total Points:</b> 19.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemera Intermitten Perennial	Other e.g. Quad Name:

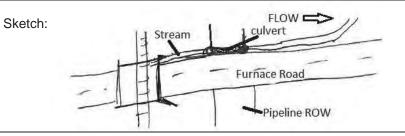
Absent	Weak	Moderate	Strong
0	1	(2)	3
0	(1)	2	3
0	1	2	3
0	(1)	2	3
0	1	2	3
0	<u> </u>	2	3
0	(1)	2	3
0	1	2	3
0	0.5	1	1.5
0	0.5	1	1.5
( No	= 0	Yes	= 3
0	1	(2)	3
0	(1)	2	3
1.5	1	0.5	0
0	0.5	1	1.5
0	0.5	1	1.5
No	= 0	Yes	= 3
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 0 1 0 0 0.5 0 No = 0 1 0 1 1 1.5 1 0 0.5	0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 0 1 2 0 0 1 2 0 0 1 2 0 0 1 2 0 0 1 2 0 0 5 1 0 No = 0 Yes

	15. Sediment on plants or debris	0	(0.5)	1
	16. Organic debris lines or piles	0	0.5	1
	17. Soil-based evidence of high water table?		No = 0	)
•	C. Biology (Subtotal = 7.75			

2. 2.0.0gy (Castota:				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	9	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75	OBL = 1.5 Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet: 04\_B-STR-09.



		Stre	Unit	fied Stream M	lethodology f	for use in Virg		m 1)			
Project #		Project Name		wadeable chan  Locality	nels classified a Cowardin Class.	HUC	perennial Date	SAR#	Impact/SAR	Impact	
N/A	DC	C2RVA - Area	02	VA	R4SB	02070010	10/20/2015		length	Factor	
	e(s) of Evalua			e and Informa	_		101-01-010				
	K. Astroth					02-S	ΓR-44				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal	Conditional Catego Mar	ginal	Po	or	Sev	ere	
	1	WAR AND	1			less than Severe or	Overwiden		1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or full) bankfull benches. and transverse ba	or active erosion; 80- inks. Vegetative m or natural rock, 100%). AND/OR /bankfull benches sess to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, of floodplains along reach. Transient	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Sei temporary/tran instability. Depositi	stable than Severe ower bank slopes. resent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sisent, contribute to torming/present.	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	Deeply incised vertical/lateral ininicision, flow con banks. Streambe rooting depth, m vertical/lunderc protection present c banks, is not pre Obvious bank slt Erosion/raw ban AND/OR Aggradin	stability. Severe tained within the do below average ajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%.	
	sediment deposition 10% of	on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depos	ks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	c
Score	3	3	2	.4		2	1.	6	1		2.
		A   4 -    -	400 f4		CAD /		4     +   - 0		tabla)		
z. KII AKIAI		Assess both bank	Con	an areas along the ditional Cate ptimal	gory	ugh measuremen	ts of length & wid		notes>>		
Riparian Buffers	Opti	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate	gory	Ginal  Low Marginal:  Non-maintained, dense herbaceous vegetation,					
Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cr. non-maintained un	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ir iparian areas lacking shrub and tree stratum, hor production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow.	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow.	Tree stratum (dbh: with > 60% tree or non-maintained un located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream bankeach by measurin Score for each ries.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 40%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  1. Delineate ripadescriptors. 2. Determine scoelow. 3. Enter the % I	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bani each by measurin Score for each ri 40% 0.6	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 40% 0.75	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 20% 1.1	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	NOTES>>	cores*0.01)/2	
Riparian Buffers  Condition Scores  1. Delineate ripadescriptors. 2. Determine scoelow. 3. Enter the % I	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin  Score for each ri  40%  0.6	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 40% 0.75	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums iparian qual 100	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >	0.76	C
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. Right Bank Left Bank 3. INSTREAL	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  M Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin  Score for each ri  40%  0.6  15%  0.5  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 40% 0.75	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 1.1  15% 0.75  by and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>		
Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  Jundercut banks;	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin  Score for each ri  40%  0.6  15%  0.5  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 40% 0.75	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 1.1  15% 0.75  by and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the condition of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	0.76	
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. Right Bank Left Bank 3. INSTREAL	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin  Score for each ri  40%  0.6  15%  0.5  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 40% 0.75  10% 0.6  zes, water velocit exes, stable featur	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. ( In the blocks below 20% 1.1  15% 0.75  by and depths; wo res.  Conditiona ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided in the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, injarian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the covided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	0.76	
Condition Scores  1. Delineate rip. descriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree conon-maintained un located within th  1.  arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> root mats; SAV; r  Opti Habitat elements a	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bank each by measurin Score for each ri 40% 0.6  15% 0.5  aried substrate si iffle poole completimal are typically present	Con Suboy High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 40% 0.75  10% 0.6  zes, water velocit exes, stable featur  Suboy Stable habitat ele present in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 20% 1.1  15% 0.75  by and depths; wo res.  Conditiona ptimal ments are typically % of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the condition of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the rovided for you  bris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks ended to the blocks ended	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	0.76	
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi. root mats; SAV; r  Opti Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bank each by measurin Score for each ri 40% 0.6  15% 0.5  aried substrate si iffle poole completimal are typically present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 40% 0.75  10% 0.6  Zes, water velocit exes, stable featur  Subop Stable habitat ele present in 30-509 are adequate fo popul	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 20% 1.1  15% 0.75  by and depths; wo res.  Conditional ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the rovided for you  bris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to f % R Blocks end	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%  100%	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	0.76	C 0.8

	St	ream In	npact A	ssessm	ent Fo	rm Page	2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB	02070010	10/20/2015			
	ALTERATION: Stream cross poil piles, constrictions, livestock Negligible			al Category	straightening of cl	hannel, channeliza		NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		0% of reach is of the channel n the parameter R 80% of banks oion, riprap, or		
	1.5	1.3	1.1	0.9	0.7	0.	_		

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: View of stream in roadside ditch as it flows under railroad (upstream)

Bottom Right: Typical view downstream, away from railroad

NC DWQ Stream Identification Form Version 4.11

02-STR-44

Date: 10/20/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.671010
Evaluator: K. Astroth	County: Prince William	Longitude: -77.234612
<b>Total Points:</b> 19.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemera Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 7.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0		2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	0	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	$\bigcirc$	2	3
6. Depositional bars or benches	0	$\overline{}$	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	o = 0	Yes =	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 4)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	(No	0 = 0	Yes =	= 3
C. Biology (Subtotal = $\frac{7.75}{}$ )				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	Y	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		ACW = 0.75	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other methods.	See p. 35 of manua	al.		
Notes: Field Sheet: 04-B-STR-08.				
4	Furnace R culvert	d gated entrar forested ar		

		Stre	am A		ment Methodology f		_	m 1)			
			For use in	wadeable chan	nels classified a	s intermittent or	perennial		I	lus us a st	
Project #	ı	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area		VA	R1	02070010	10/20/2015				
Nam	e(s) of Evaluation	tor(s)	Stream Nam	e and Informa		FD 45					
0116	K. Astroth						Occoquan	River)			
. Channel C	Condition: Asse			С	Conditional Catego	ry	_		-		
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
		AND STATES		ew areas of active	Poor. Banks more	less than Severe or stable than Severe	Overwidene Vertically/laterally u	ınstable. Likely to	Deeply incised	(or excavated),	
Channel Condition	Very little incision of 100% stable bar surface protection prominent (80-1) Stable point bars' are present. Acce floodplain or fully bankfull benches. and transverse be	n or natural rock, 00%). AND/OR bankfull benches as to their original or developed wide Mid-channel bars,	of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream of the bankfull benches, d floodplains along reach. Transient	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may brout. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Majr are near vertical. E 60-80% of banl protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	rosion present on as. Vegetative on 20-40% of fficient to prevent a 60-80% of the d by sediment. orary/transient in uting to instability.	vertical/lateral in: incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sic Erosion/raw ban	stability. Severe trained within the do below average pajority of banks ut. Vegetative on less than 20% of eventing erosion. Doughing present. ks on 80-100%.	
	sediment depositio		sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the bark sediment depos	on is present on > ks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1		3.0
NOTES>>				Field Shee	t: 04-B-STF	R-07. Occo	guan River.				
. RIPARIAI	N BUFFERS: A	Assess both bank	s's 100 foot riparia					h may be accep	table)		
. RIPARIAI			Con	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt		table)		
. RIPARIAI Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	imal  3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the	e entire SAR. (ro						
Riparian Buffers	Opti  Tree stratum (dbh - with > 60% tree ca	imal  3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian Buffers	Opti  Tree stratum (dbh - with > 60% tree ca	imal 3 inches) present, anopy cover and a derstory. Wellands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scoelow.	Opti	imal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban ach by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or ther comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow.	Tree stratum (dbh > with > 60% tree canon-maintained und located within the	imal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban ach by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or ther comparable conditions.  Low 0.5	NOTES>>		
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal 3 inches) present, anopy cover and a terstory. Wetlands e riparian areas.  5  each stream ban each stream ban each by measurin Score for each ri 10%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in 30%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prov. 30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5		cores*0.01)/2	CI
Riparian Buffers  Condition Scores  Delineate rips Secriptors. Determine Scolow. Enter the % I	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands eriparian areas.  5  each stream ban ach by measurin  Score for each ri  10%  0.75	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 30% 0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prov. 30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums imparian qual 100 100%	NOTES>>  Cl= (Sum % RA * Si		CI 0.93
Riparian Buffers  Condition Scores  Delineate ripsecriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree or non-maintained und located within the located with	5  sach stream ban ach by measurin 10% 0.75 5% 0.6 aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 30% 0.85	the areas along the ditional Categories and County of the blocks below 1.1	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the second of the second	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ex	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si  Rt Bank Cl >	1.02	
Condition Scores  Delineate rippscriptors. Determine scolow. Enter the % I Right Bank  Left Bank  INSTREAL	Tree stratum (dbh > with > 60% tree canon-maintained une located within the located withi	imal  3 inches) present, anopy cover and a ferstory. Wetlands er riparian areas.  5  sach stream ban each by measurin 10% 0.75  5% 0.6 aried substrate siffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 30% 0.85  95% 0.85  zes, water velocit exes, stable feature	to a reas along the ditional Categorithmal  Low Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Coungth and width. Coungth and depths; wores.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, conditions.  Low 0.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	1.02	
Riparian Buffers  Condition Scores Delineate ripescriptors Determine scelow Enter the % I	Tree stratum (dbh > with > 60% tree or non-maintained und located within the located with	imal  3 inches) present, anopy cover and a ferstory. Wetlands er riparian areas.  5  sach stream ban each by measurin 10% 0.75  5% 0.6 aried substrate siffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 30% 0.85  95% 0.85  zes, water velocit exes, stable featur	con areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. Congth an	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the condition of the canopy cover.  30%  1.2	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ex	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	1.02	
Condition Scores  Delineate ripescriptors Determine scelow Enter the % I Right Bank Left Bank INSTREAI ndercut banks;	Tree stratum (dbh > with > 60% tree co non-maintained und located within the located with	imal  3 inches) present, anopy cover and a ferstory. Wetlands er riparian areas.  5  seach stream ban each by measurin 10% 0.75  5% 0.6 aried substrate si fifte poole completimal re typically present	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canpy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating leeparian category in 30% 0.85  95% 0.85  zes, water velocitixes, stable features suboptimes su	un areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Coungth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (6th > 3 inches) present, with + 20% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  100%  100%  100%	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	1.02	

Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R1	02070010	10/20/2015	02-STR-45		
	_ ALTERATION: Stream cross poil piles, constrictions, livestock Negligible			al Category	erate		ere	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		of the channel in the parameter PR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

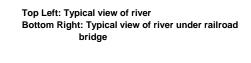
THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

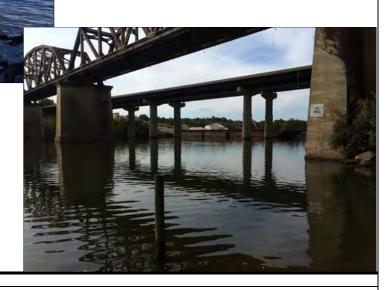
COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

INSERT PHOTOS:





NC DWQ Stream Identification Form Version 4.11 Occoquan River 02-STR-45

Date: 10/20/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.667640
Evaluator: K. Astroth	County: Prince William	Longitude: -77.239324
Total Points: 47 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 20)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	9	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	N	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 10 )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	<b>1</b>	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	= 3
C. Biology (Subtotal = 17				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	(3)
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	<b>(</b> 1.5 <b>)</b>
23. Crayfish	0	0.5	1	
24. Amphibians	0	0.5	1	
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACVV = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other meth	ods. See p. 35 of manua	al.		
Notes: Filed Sheet: 04-B-STR-07.				
Sketch: Pailroad		High	iway 1	
Kaliload	bridge	\ \ Brid		
Occoquan River	1-1	1		
<b>&lt;</b> ⇒FLOW	- 1-1	111		
	= -			
		11		
Boat doc	k	1 , 1		

### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral stream Cowardin Impact HUC SAR# Project # **Project Name** Locality Date Class length Factor N/A DC2RVA - Area 02 ۷A 02070010 10/20/2015 R6 Name(s) of Evaluator(s) Stream Name and Information K. Astroth 02-STR-46 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Optimal Suboptimal Marginal Field Sheet: 04-B-Low Marginal: Non-maintained, dense herbaceous regetation, ripariar High Poor: Lawn STR-06. owed, and High Suboptimal Riparian areas wit ree stratum (dbh ow Suboptimal High Marginal: Non-maintained, dense herbaceous maintained areas nurseries; no-till Low Poor: Impervious surfaces, mine Riparian areas with ree stratum (dbh : cropland; actively reas lacking shrub 3 inches) present, with 30% to 60% 3 inches) present, with >30% tree Tree stratum (dbh > 3 inches) present vegetation with and tree stratum. grazed pasture spoil lands. Riparian either a shrub layer or a tree layer (dbh 3 inches) present with <30% tree hay production, conds, open wate If present, tree stratum (dbh >3 with > 60% tree canopy cover and an non-maintained understory. Wetlands parsely vegetate non-maintained lenuded surfaces tree canopy cover and containing bot herbaceous and anopy cover and maintained nderstory. Recer row crops, active feed lots, trails, or **Buffers** area, recently other comparable shrub layers or a cutover (dense canopy cover. inches) present abilized, or othe conditions. non-maintained vegetation). with <30% tree comparable condition. understory. canopy cover with maintained understory. High Low High Low High Low Condition 0.85 0.75 0.6 0.5 1.5 1.2 1.1 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 15% 60% 25% 100% Right Bank Score > 1.2 0.85 0.75 CI= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> 15% 20% 65% 100% CI Rt Bank CI > 0.88 Left Bank 1.2 0.6 0.5 It Bank CI > 0.63 0.75 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number. THE REACH CONDITION INDEX (RCI) >> 0.38 RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF INSERT PHOTOS: Typical view of stream



NC DWQ Stream Identification Form Version 4.11

02-STR-46

Date: 10/20/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.661482
Evaluator: K. Astroth	County: Prince William	Longitude: -77.246109
<b>Total Points:</b> 16.25 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Determittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 10	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence				
4. Particle size of stream substrate	0		2	3
5. Active/relict floodplain	0		2	3
6. Depositional bars or benches	0		2	3
7. Recent alluvial deposits	0	<u> </u>	2	3
8. Headcuts	0	$\frac{1}{2}$	2)	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 1.5)			T	T
12. Presence of Baseflow		1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 4.75			_	
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	<b>8</b>	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.73;	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other method	ds. See p. 35 of manua			
Notes: Field Sheet: 04-B-STR-06.	·			
- 700 North Grand Maria	e (80 ,	thick her	b.laver	
Sketch: "3' wide dry channel		zillok ilo	V ()	
Stream Some cobble	FLOW		Culvert	13
Stream 5		16		
	and the same of th	NU		
		tree roots		
Road		throughout cl	nanněl	
Culvert 1/1		an ougnout C	idiffici	

		Stre				Form for use in Virg	) (For	m 1)			
			For use in	wadeable chan	nels classified a	s intermittent or	perennial		Impact/SAR	Impost	
Project #	ı	Project Name	•	Locality	Class.	HUC	Date	SAR#	length	Impact Factor	
N/A		2RVA - Area		VA	R4SB	02070010	10/20/2015				
Name	e(s) of Evalua K. Astroth	tor(s)	Stream Name	e and Informa	ation	02.67	ΓR-47				
Channal	condition: Asse	46	ti				K-41				
Chamile				C	onditional Catego	ry	D-		0		
	Opti	mai	Subo	ptimal	Iviar	ginal	Po	or	Sev	ere	
	1	AND STATES		ew areas of active	Poor. Banks more	less than Severe or stable than Severe		unstable. Likely to	Deeply incised	(or excavated),	
Channel Condition	Very little incision o 100% stable bar surface protection prominent (80-1) Stable point bars', are present. Acce floodplain or fully bankfull benches. and transverse ba	n or natural rock, 00%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars,	Vegetative protect prominent (60- Depositional feat stability. The ban channels are wel likely has access to or newly developer	table (60-80%).  tion or natural rock  80%) AND/OR  ures contribute to  tikfull and low flow  I defined. Stream  b bankfull benches,  d floodplains along	Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Set temporary/tran instability. Depositiv.	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Major are near vertical. E 60-80% of bank protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contributions.	rosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present obanks, is not pre Obvious bank sle Erosion/raw ban	stability. Severe tained within the do below average lajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%.	
	sediment depositio 10% of	n covers less than	sediment cover	each. Transient s 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have ion on > 40% of the ional features which to stability.	AND/OR V-shape vegetative protection 40% of the barn sediment depos	on is present on > aks and stable	AND/OR Aggradin than 80% of strean deposition, contrib Multiple thread subterran	bed is covered by uting to instability. channels and/or	CI
Score	3	}	2	.4	:	2	1.	6	1		2.0
NOTES>>				Fi	eld Sheet:	04-B-STR-0	<b>)</b> 5.				
. RIPARIAN	N BUFFERS: A	Assess both bank	c's 100 foot riparia	in areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt	h may be accep	table)		
	1			ditional Cate					NOTES>>		
Riparian Buffers	Tree stratum (dbh > with > 60% tree conon-maintained und located within the	· 3 inches) present, inopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present,	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or			
			shrub layers or a non-maintained understory.	Recent cutover (dense vegetation).	with <30% tree canopy cover.	stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	and stabilized, or other comparable condition.	other comparable conditions.			
Condition	1.	5	High 1.2	Low 1.1	High 0.85	0.75	High 0.6	0.5	-		
escriptors.  Determine squalow.	arian areas along of the state	each stream ban	k into Condition C	ategories and Co	I ondition Scores us Calculators are pr	sing the	Ensure the of % R	ne sums iparian			
Right Bank	% Riparian Area>	30%	50%	20%			DIOUNG 60	100%			
giit Balik	Score >	0.6	0.85	1.1					Cl= (Sum % RA * S	coroe*0.01\/2	
Laft Dawl	% Riparian Area>	30%	50%	20%				100%	Rt Bank CI >	0.83	CI
Left Bank	Score >	0.6	0.85	1.1					Lt Bank CI >	0.83	0.83
11.16	M HABITAT: Va				ody and leafy deb	oris; stable substr	ate; low embeded	ness; shade;	NOTES>>		
		me poole comple	ones, stable lediul		I Category						
ndercut banks;	Tool mais, SAV, II			Containone							
ndercut banks;	Opti	mal		ptimal		ginal	Po Habitat elements				
Instream		re typically present	Stable habitat eler present in 30-50%	ptimal ments are typically 6 of the reach and r maintenance of	Stable habitat ele present in 10-30% are adequate fo	ginal ments are typically of the reach and r maintenance of ations.	Po Habitat elements lacking or are un elements are typica than 10% of	listed above are estable. Habitat ally present in less			CI

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB	02070010	10/20/2015	02-STR-47		
	_ ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, conc		concrete blocks,	straightening of ch	hannel, channeliz	ation,	NOTES>>	
	Negligible	Mi	nor		erate	Sev	ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5	1	
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

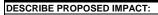
COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: Typical view upstream Bottom Right: Typical view of stream



NC DWQ Stream Identification Form Version 4.11

02-STR-47

Date: 10/20/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.661350
Evaluator: K. Astroth	County: Prince William	Longitude: -77.246309
<b>Total Points:</b> 29.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemera Intermittent Perennial	Other e.g. Quad Name:

If ≥ 19 or perennial if ≥ 30°			ű	
A. Geomorphology (Subtotal = 18)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	o = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 4.5 )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	( No	0 = 0	Yes :	= 3
C. Biology (Subtotal = $6.75$ )			_	
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3

21. Aquatic Mollusks 2 1.5 22. Fish 0.5 1 23. Crayfish 1 1.5 24. Amphibians 0.5 1 1.5 25. Algae 0.5 1.5 FACW = 0.73; OBL = 1.5 Other = 026. Wetland plants in streambed

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Substrate of sand, cobble, and bedrock. Field Sheet: 04-B-STR-05.

Sketch:

Ballast Culvert Pool Pool Bedrock downslope

Exposed Bedrock Large Small cobble pool

### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral stre Impact Cowardin SAR # Project # **Project Name** Locality HUC Date Class length Factor N/A ۷A 02070010 10/19/2015 DC2RVA - Area 02 R6 Name(s) of Evaluator(s) Stream Name and Information D. Mitchell, W. Moorhead 02-STR-48 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable **Conditional Category** NOTES>> Field Optimal Suboptimal Marginal Sheet: 04-B-STR-04. Low Marginal: Non-maintained ligh Poor: Lawns Low Suboptimal High Marginal: dense herbaceous maintained areas Low Poor: Riparian areas wit Riparian areas with regetation, riparian reas lacking shrub and tree stratum, hay production, nurseries; no-till cropland; actively Non-maintained, dense herbaceou Impervious surfaces, mine tree stratum (dbh: 3 inches) present, with 30% to 60% tree stratum (dbh: 3 inches) present, with >30% tree Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands vegetation with ither a shrub laye grazed pasture spoil lands, enuded surface Riparian parsely vegetate non-maintained tree canopy cove anopy cover and Buffers or a tree layer (dbl onds, open wate row crops, active and containing bot maintained areas. 3 inches) present If present, tree area, recently feed lots, trails, or inderstory. Recen cutover (dense vegetation). herbaceous and stratum (dbh >3 inches) present, with <30% tree canopy cover with with <30% tree seeded and other comparable conditions. shrub layers or a non-maintained understory. abilized, or othe comparable condition. canopy cover understory High Low High Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. Ensure the sums . Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 50% 50% 100% Right Bank Score > 0.6 1.1 CI= (Sum % RA \* Scores\*0.01)/2 CI 40% 40% 20% 100% % Riparian Area> Rt Bank CI > 0.85

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

OTE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REA

0.75

1.5

0.5

Score >

THE REACH CONDITION INDEX (RCI) >>

RCI= (Riparian CI)/2

Lt Bank CI >

0.80

0.83

0.42

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:

Left Bank



NC DWQ Stream Identification Form Version 4.11

02-STR-48

Date: 10/19/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.656872
Evaluator: D. Mitchell, W. Moorhead	County: Prince William	Longitude: -77.249131
Total Points: 18 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 7)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	8	1	2	3
8. Headcuts	0	Ω	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	(N	0 = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 5)			I	
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	= 3
C. Biology (Subtotal = 6				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians		0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			
*perennial streams may also be identified using other methods	. See p. 35 of manua	al.		
Notes: Dry at time of assessment. Field Sheet: 04-	B-STR-04.			
	cod Herba ceous	OREST		
5 /	1 }			

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral stre Impact Cowardin SAR # Project # **Project Name** Locality HUC Date Class length Factor N/A ۷A 02070010 10/19/2015 DC2RVA - Area 02 R6 Name(s) of Evaluator(s) Stream Name and Information D. Mitchell, W. Moorhead 02-STR-49 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable **Conditional Category** NOTES>> Field Optimal Suboptimal Marginal Sheet: 04-B-STR-03 Low Marginal: Non-maintained, dense herbaceous regetation, ripariar High Poor: Lawn 100 ft owed, and High Suboptimal Riparian areas wit ree stratum (dbh ow Suboptimal High Marginal: Non-maintained, dense herbaceous maintained areas nurseries; no-till Low Poor: Impervious surfaces, mine up/downstream. Riparian areas with ree stratum (dbh: cropland; actively reas lacking shrub 3 inches) present, with 30% to 60% 3 inches) present, with >30% tree Tree stratum (dbh > 3 inches) present vegetation with and tree stratum. grazed pasture spoil lands. Riparian with > 60% tree canopy cover and an non-maintained understory. Wetlands areas. either a shrub layer or a tree layer (dbh 3 inches) present with <30% tree hay production, conds, open wate If present, tree stratum (dbh >3 parsely vegetate non-maintained lenuded surfaces tree canopy cover and containing bot herbaceous and anopy cover and maintained nderstory. Recer row crops, active feed lots, trails, or **Buffers** area, recently other comparable shrub layers or a cutover (dense canopy cover. inches) present abilized, or othe conditions. non-maintained vegetation). with <30% tree canopy cover with maintained understory. comparable condition. understory. High Low High Low High Low Condition 0.85 0.75 0.6 0.5 1.5 1.2 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below. Blocks equal 100

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

90%

0.6

95%

0.5

% Riparian Area>

% Riparian Area>

Score

Right Bank

Left Bank

10%

1.2

5%

1.2

THE REACH CONDITION INDEX (RCI) >> 0.30

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

Rt Bank CI >

Lt Bank CI >

CI= (Sum % RA \* Scores\*0.01)/2

0.66

0.54

CI

0.60

CR = RCI X LF X IF

100%

100%



NC DWQ Stream Identification Form Version 4.11

02-STR-49

Date: 10/19/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.653371
Evaluator: D. Mitchell, W. Moorhead	County: Prince William	Longitude: -77.250235
<b>Total Points:</b> 16 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral ntermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = $8.5$ )	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence				
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	<u>T</u>	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	Ō	1	9	3
8. Headcuts	0		<b>2</b>	3
9. Grade control	0	0.5	1	1.5
10. Natural valley		0.5	1	1.5
11. Second or greater order channel	(No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $1.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
C. Biology (Subtotal = 6				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	6	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish		0.5	1	1.5
24. Amphibians		0.5	1	1.5
25. Algae	8	0.5	1	1.5
26. Wetland plants in streambed			OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method	Is. See p. 35 of manua			
Notes: Field Sheet: 04-B-STR-03.				
	-			
Sketch:	1			
₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩				
roots Pipe	eline ROW			
	~			
FOREST				
Jul 1 1				
/ )				

		Stre	Uni	fied Stream M	lethodology f	for use in Virg		m 1)			
Project #		Project Name		Locality	nels classified a Cowardin Class.	HUC	Date Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	02	VA	R2SB	02070010	10/19/2015				
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa							
D. Mito	chell, W. Mo	orhead			02-ST	TR-50 (N	larumsco	Creek)			
1. Channel (	Condition: Asse	ess the cross-sec	tion of the stream		ondition (erosion,						
	Opt	imal	Subo	ptimal		ginal	Po	or	Sev	ere	
	1	WA SHARE		~		less than Severe or			1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars are present. Acce floodplain or fully bankfull benches. and transverse ba	Very little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient collineat deposition cover less than collineat deposition cover less than		tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow Il defined. Stream o bankfull benches, d floodplains along	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe ower bank slopes. seent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- is covered by diment may be sisent, contribute on that contribute to to forming/present.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/Of stream is covere Sediment is temp nature, and contril	widen further. Majority of both banks		(or excavated), stability. Severe tained within the sed below average lajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%.	
				portions of the reach. Transient sediment covers 10-40% of the stream bottom.		stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.		AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.		g channel. Greater h bed is covered by uting to instability. channels and/or ean flow.	С
Score	;	3	2	.4	:	2	1.	6	1	l	2.0
		Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	h may be accep	table)		
		Assess both bank	Con	an areas along the ditional Cate ptimal	gory	ginal	ts of length & wid		NOTES>>		
Riparian Buffers	Opt Tree stratum (dbh: with > 60% tree ci	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate	gory	Ginal  Low Marginal:  Non-maintained, dense herbaceous vegetation,					
Buffers	Opt  Tree stratum (dbh: with > 60% tree ci. non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ir iparian areas lacking shrub and tree stratum, hor production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
	Opt  Tree stratum (dbh: with > 60% tree ci. non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strain areas along quare footage for 6 Riparian Area and	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  .5  each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums iparian qual 100			
Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree ci. non-maintained un located within th  arian areas along quare footage for e Riparian Area and	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the %	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strain areas along quare footage for 6 Riparian Area and	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  .5  each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums iparian qual 100		cores*0.01)/2	
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Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % Right Bank  Left Bank  3. INSTREA	Tree stratum (dbh: with > 60% free ci. non-maintained un located within th located within th  arrian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each ri  100%  0.85  100%  0.85  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denude surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >  Lt Bank CI >  NOTES>>	0.85 0.85	CC 0.8
Condition Scores  1. Delineate rip descriptors. 2. Determine su below. 3. Enter the % Right Bank  Left Bank  3. INSTREA	Tree stratum (dbh with > 60% tree ci non-maintained un located within th located within th sarian areas along quare footage for e Riparian Area and % Riparian Area > Score > M HABITAT: V; root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5  each stream ban each by measurin 100% 0.85  100% 0.85  aried substrate si iffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the rovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 10.5  L	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	0.85 0.85	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks Instream Habitat/ Available	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  100%  0.85  100%  0.85  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en  Attention of the comparable condition of the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>> Coarse gra	0.85 0.85	0.8
Condition Scores  1. Delineate rip descriptors. 2. Determine su below. 3. Enter the % Right Bank  Left Bank  3. INSTREA undercut banks Instream Habitat/	Tree stratum (dbh: with > 60% tree ci. non-maintained un located within th located within th located within th sarian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: V; root mats; SAV; r  Opt Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  100%  0.85  100%  0.85  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the rovided for you  bris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to f % R Blocks end	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%  100%	Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>> Coarse gra	0.85 0.85	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point Project # Date SAR length Impact Factor R2SB 02070010 10/19/2015 02-STR-50 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. CI SCORE 1.5 1.3 1.1 0.9 0.7 0.5 1.30 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF INSERT PHOTOS:



Top Left: View upstream at culvert under railroad Bottom Right: Typical view downstream



NC DWQ Stream Identification Form Version 4.11 Marumsco Creek 02-STR-50

Date: 10/19/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.651097
Evaluator: D. Mitchell, W. Moorhead	County: Prince William	Longitude: -77.250875
<b>Total Points:</b> $44.25$ Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 22)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	(3)
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	N	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $9.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5

C. Biology (Subtotal = 12.75 )

17. Soil-based evidence of high water table?

18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	(2)	3
22. Fish	0	0.5	(1)	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75,	OBL = 1.5 Other = 0	0

No = 0

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Tidal, Bar =potential (poor) Aeschynome: Panicum dichotomiflorum, Echiniochloa crus gali, Leersia oryzoides, Persicaria lougseta, ornimental Eetana, Glechoma. Photos 973, 974. Field Sheet: 04-B-STR-02.

Sketch: Marumsco Creek

		Stre					ı (Fori	11 1)			
				fied Stream M wadeable chan							
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area	-	VA	R2	02070010	10/19/2015				
	e(s) of Evaluat	` '	Stream Nam	e and Informa	ation	00.0	FD <b>F</b> 4				
	chell, W. Mod					02-S	I K-51				
Channel C	Condition: Asse	ss the cross-sec	tion of the stream		ondition (erosion, conditional Categor						
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	rere	
	The second second		Slightly incised, fr	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally u		Deaply incired	(or excavated),	
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-10 Stable point bars/t are present. Acces floodplain or fully bankfull benches.	iks. Vegetative or natural rock, 00%). AND/OR bankfull benches as to their original developed wide Mid-channel bars,	erosion or unproted of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along	both banks. Vegel 40-60% of banks. bevertical or unde 60% of strean sediment. Sec temporary/tran	wer bank slopes. esent on 40-60% of tative protection on Streambanks may rcut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Major are near vertical. E 60-80% of bank protection preser banks, and is insul erosion. AND/OF stream is covere Sediment is tempor nature, and contrib	rosion present on as. Vegetative at on 20-40% of ficient to prevent a 60-80% of the d by sediment.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, n vertical/underc protection present of banks, is not pre	stability. Severe national within the ad below average najority of banks eut. Vegetative on less than 20% of eventing erosion. oughing present.	
	and transverse ba sediment deposition 10% of b	covers less than	portions of the r sediment cover	reach. Transient rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the onal features which to stability.	AND/OR V-shape vegetative protection 40% of the band	d channels have on is present on > ks and stable	AND/OR Aggradin	g channel. Greater n bed is covered by outing to instability. channels and/or	CI
Score	3		2	.4		2	1.	6	1	l	2.4
1012022		- Cilaiio	,			, B 0111 01	100 11 4011	nstream o			
		Giidiis	•	ditional Categ		+ B GIK GI	Too it dow	nstream c	NOTES>>	Mature	
	Opti		Con		gory	ginal	Po		NOTES>> forest on r	ight side.	
ar	Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, no you vour and a erstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy	gory				NOTES>> forest on r Succession scrub, herl mosaic on	ight side. nal forest, paceous	
ar Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopcover and a erstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	NOTES>> forest on r Succession scrub, herl mosaic on	ight side. nal forest, paceous	
ar Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a erstory. Wetlands riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> forest on r Succession scrub, herl mosaic on	ight side. nal forest, paceous	
Condition Scores  Delineate rip: secriptors. Determine so	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a erestory. Wetlands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tweth < 30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> forest on r Succession scrub, herl mosaic on	ight side. nal forest, paceous	
Riparian Buffers  Condition Scores  Delineate ripiscriptors. Determine solow.	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a erestory. Wetlands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tweth < 30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Poor:	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> forest on ri Succession scrub, herl mosaic on	ight side. nal forest, paceous left side.	
Riparian Buffers  Condition Scores  Delineate rips scriptors. Determine sclow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the strain areas along equare footage for earlian Area and % Riparian Area >	3 inches) present, nopy cover and a erestory. Wetlands or inparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tweth < 30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Poor:	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> forest on r Succession scrub, herl mosaic on	ight side. nal forest, paceous left side.	CI
Riparian Buffers  Condition Scores  Delineate rips scriptors. Determine sclow. Enter the % I	Tree stratum (dbh > with > 60% tree ca a non-maintained und located within the located wi	3 inches) present, nopy cover and a eristory. Wetlands riparian areas.  5 each stream ban ach by measurin Score for each ri 100% 1.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tweth <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Poor:	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%	NOTES>> forest on ri Succession scrub, herl mosaic on	ight side. nal forest, paceous left side.	CI 1.35
Riparian Buffers  Condition Scores Delineate rips Scriptors Determine scow. Enter the % I	Tree stratum (dbh > with > 60% tree ca a non-maintained und located within the located wi	mal  3 inches) present, nopy cover and a enstory. Wetlands riparian areas.  5  each stream ban ach by measurin  Score for each ri  100%  1.5  60%  1.5	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 40% 0.75 zes, water velocii	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the second of the second	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks ec	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%	NOTES>> forest on ri Succession scrub, heri mosaic on  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01//2 1.50 1.20	
Riparian Buffers  Condition Scores  Delineate ripsoriptors. Determine sclow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	3 inches) present, nopy cover and a erstory. Wetlands riparian areas.  5 ach stream ban ach by measurin 100% 1.5  60% 1.5 ried substrate siffle poole complete the complete stream of t	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  40% 0.75  zes, water velocit exes, stable featu	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and width. Congth and depths; wores.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <					

	St	ream In	pact A	ssessm	ent For	m Page	2		
Project #	Applicant	Date	Data Point	SAR length	Impact Factor				
N/A	CSX		VA	R2	02070010	10/19/2015	02-STR-51		
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock  Conditional Category									
	Negligible	Mir	nor	Mode	erate	Sev	ere		
Channel		Less than 20% of the stream reach	20-40% of the stream reach is	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter				
Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	alterations listed i guidelines AND/O shored with gal cem	n the parameter R 80% of banks bion, riprap, or		

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

### INSERT PHOTOS:



View downstream, away from railroad.

NC DWQ Stream Identification Form Version 4.11

02-STR-51

Date: 10/19/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.650717
Evaluator: D. Mitchell, W. Moorhead	County: Prince William	Longitude: -77.250261
<b>Total Points:</b> 23.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

S. Active/relict floodplain   0	if ≥ 19 or perennial if ≥ 30*	Epitemeral litte	Timilite in a referring	e.g. Quad Name.	
Continuity of channel bed and bank	A Geomorphology (Subtotal – 10.5	Absent	Weak	Moderate	Strong
2. Sinuosity of channel along thalweg 3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence 4. Particle size of stream substrate 5. Active/relict floodplain 6. Depositional bars or benches 7. Recent alluvial deposits 8. Headcuts 9. Grade control 10. Natural valley 11. Second or greater order channel 12. 3 13. Hydrology (Subtotal = 6.5 14. Leaf litter 15. Sediment on plants or debris 16. Organic debris lines or piles 17. Soil-based evidence of high water table? 18. Fibrous roots in streambed 19. Rooted upland plants in streambed 20. Macrobenthos (note diversity and abundance) 21. Apuglish 22. 3 23. 3 24. Amphibians 25. Active/relict floodplain 26. 3 27. 3 28. 4. Capfish 29. 3 39. Grade control 30. 1			1		·
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence   0		-	 1		
Particle size of stream substrate   0					
S. Active/relict floodplain   0		0	$\odot$	2	3
S. Depositional bars or benches   0	4. Particle size of stream substrate	0	1)	2	3
7. Recent alluvial deposits  8. Headcuts  9. Grade control  10. Natural valley  11. Second or greater order channel  12. 3  13. Hydrology (Subtotal = 6.5  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?  18. Fibrous roots in streambed  19. Rooted upland plants in streambed  19. Rooted upland plants in streambed  20. Macrobenthos (note diversity and abundance)  21. Fish  22. Table 23. 3  23. Crayfish  24. Amphibians  24. Amphibians  25. Sediment on plants or devise in streambed  26. Organic Macrobenthos (note diversity and abundance)  27. Soil-based evidence of high water table?  28. Sediment on plants in streambed  29. Macrobenthos (note diversity and abundance)  20. Macrobenthos (note diversity and abundance)  20. O.	5. Active/relict floodplain	0	1	2	3
3	6. Depositional bars or benches	(0)	1	2	3
0	7. Recent alluvial deposits	0	1	2	3
1. Second or greater order channel	8. Headcuts	0	1	(2)	3
1. Second or greater order channel	9. Grade control	_	0.5	1	1.5
1. Second or greater order channel	10. Natural valley	0	0.5	1	1.5
3	11. Second or greater order channel		o = 0	Yes	= 3
12. Presence of Baseflow   0	a artificial ditches are not rated; see discussions in manual				
3   Iron oxidizing bacteria	B. Hydrology (Subtotal = <u>6.5</u> )				
1.5	12. Presence of Baseflow	0	1	2	3
15. Sediment on plants or debris	13. Iron oxidizing bacteria	0	(1)	2	3
16. Organic debris lines or piles       0       0.5       1       1.5         17. Soil-based evidence of high water table?       No = 0       Yes = 3         C. Biology (Subtotal = 6.25 )       0       1       0         18. Fibrous roots in streambed       3       2       1       0         19. Rooted upland plants in streambed       3       2       1       0         20. Macrobenthos (note diversity and abundance)       0       1       2       3         21. Aquatic Mollusks       0       1       2       3         22. Fish       0       0.5       1       1.5         23. Crayfish       0       0.5       1       1.5         24. Amphibians       0       0.5       1       1.5	14. Leaf litter	1.5	1	0.5	0
17. Soil-based evidence of high water table?   No = 0   Yes = 3     18. Fibrous roots in streambed   3   2   1   0     19. Rooted upland plants in streambed   3   2   1   0     10. Macrobenthos (note diversity and abundance)   0   1   2   3     11. Aquatic Mollusks   0   1   2   3     12. Fish   0   0.5   1   1.5     13. Crayfish   0   0.5   1   1.5     14. Amphibians   0   0.5   1   1.5     15. Soil-based evidence of high water table?   No = 0     Yes = 3     15. Soil-based evidence of high water table?   No = 0     18. Fibrous roots in streambed   3   2   1   0     19. Rooted upland plants in streambed   3   2   1   0     10. Soil-based evidence of high water table?   No = 0     10. Soil-based evidence of h	15. Sediment on plants or debris	0	0.5	1	1.5
C. Biology (Subtotal = 6.25 )         18. Fibrous roots in streambed       3       2       1       0         19. Rooted upland plants in streambed       3       2       1       0         20. Macrobenthos (note diversity and abundance)       0       1       2       3         21. Aquatic Mollusks       0       1       2       3         22. Fish       0       0.5       1       1.5         23. Crayfish       0       0.5       1       1.5         24. Amphibians       0       0.5       1       1.5	16. Organic debris lines or piles	0	0.5	1	1.5
18. Fibrous roots in streambed       3       2       1       0         19. Rooted upland plants in streambed       3       2       1       0         20. Macrobenthos (note diversity and abundance)       0       1       2       3         21. Aquatic Mollusks       0       1       2       3         22. Fish       0       0.5       1       1.5         23. Crayfish       0       0.5       1       1.5         24. Amphibians       0       0.5       1       1.5	17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
18. Fibrous roots in streambed       3       2       1       0         19. Rooted upland plants in streambed       3       2       1       0         20. Macrobenthos (note diversity and abundance)       0       1       2       3         21. Aquatic Mollusks       0       1       2       3         22. Fish       0       0.5       1       1.5         23. Crayfish       0       0.5       1       1.5         24. Amphibians       0       0.5       1       1.5	C. Biology (Subtotal = 6.25)				
19. Rooted upland plants in streambed       3       2       1       0         20. Macrobenthos (note diversity and abundance)       0       1       2       3         21. Aquatic Mollusks       0       1       2       3         22. Fish       0       0.5       1       1.5         23. Crayfish       0       0.5       1       1.5         24. Amphibians       0       0.5       1       1.5	18. Fibrous roots in streambed	3	(2)	1	0
21. Aquatic Mollusks     0     1     2     3       22. Fish     0     0.5     1     1.5       23. Crayfish     0     0.5     1     1.5       24. Amphibians     0     0.5     1     1.5	19. Rooted upland plants in streambed			1	0
22. Fish     0     0.5     1     1.5       23. Crayfish     0     0.5     1     1.5       24. Amphibians     0     0.5     1     1.5	20. Macrobenthos (note diversity and abundance)	(8)	1	2	3
22. Fish     0     0.5     1     1.5       23. Crayfish     0     0.5     1     1.5       24. Amphibians     0     0.5     1     1.5	21. Aquatic Mollusks	0	1	2	3
24. Amphibians 0 0.5 1 1.5	22. Fish	0	0.5	1	1.5
24. Amphibians 0 0.5 1 1.5	23. Crayfish	(0)	0.5	1	1.5
	24. Amphibians		-	1	1.5
	25. Algae	0	0.5	1	1.5

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Tributary to Marumsco Creek. Field Sheet: 04-B-STR-01, 100' downstream from head (culvert).

Sketch: grade slope

Pipeline ROW

26. Wetland plants in streambed

EACW = 0.75

OBL = 1.5 Other = 0

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
Project #		Project Name		Locality	cowardin Class.	HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	02	VA	R2SB	02070010	10/19/2015				
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
	L. Eggering					02-S	ΓR-52				
. Channel C	Condition: Asse	ess the cross-sec	tion of the stream		ondition (erosion,						
	Opti	imal	Subo	ptimal		ginal	Po	or	Sev	ere	
			The state of the s						J		
Channel Condition	Very little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Translent		erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	ew areas of active ted banks. Majority table (60-80%). tion or natural rock 80%) AND/OR ures contribute to kitfull and low flow Il defined. Stream o bankfull benches, of floodplains along each. Transient	or Poor due to lower bank slopes Erosion may be present on 40-60% both banks. Vegetative protection c 40-60% of banks. Streambanks m bevertical or undercut. AND/OR 4 60% of stream is covered by sediment. Sediment may be		widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in		Deeply incised vertical/lateral ins incision, flow con banks. Streambe rooting depth, m vertical/undercrotection present of banks, is not pre Obvious bank slc Erosion/raw ban AND/OR Aggrading.	stability. Severe tained within the do below average hajority of banks ut. Vegetative on less than 20% of venting erosion. Dughing present. ks on 80-100%.	
		and utansverse Joans tew. Translent sediment deposition covers less than 10% of bottom.		s 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the onal features which to stability.	AND/OR V-shape vegetative protection 40% of the bar sediment depos	on is present on > aks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1		2.0
. RIPARIAI	N BUFFERS: A	Assess both bank	Con	n areas along the ditional Categorimal					NOTES>>		
			0 0				Po	or			
Riparian Buffers	with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
•	with > 60% tree ca	anopy cover and a derstory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
•	with > 60% tree ca	anopy cover and a derstory. Wetlands le riparian areas.	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active fee lots, trails, or of other comparable conditions.			
Condition Scores  Delineate rip lescriptors. 2. Determine so	with > 60% tree canon-maintained unal located within the	anopy cover and a derstory. Wetlands le riparian areas.	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Congth and width. (dense and congth and co	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are processors of the condition of the condi	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
Condition Scores  Delineate rip secriptors. Determine so solow. Enter the %	with > 60% free cc non-maintained und located within th  1.  arian areas along a quare footage for e Riparian Area and % Riparian Area>	anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin Score for each ri	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating leparian category in 60%	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Congth and width. (and the blocks below 30%	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are processors of the condition of the condi	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure te of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
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Condition Scores  Delineate ripescriptors. Determine scelow. Enter the %  Right Bank	with > 60% free cc non-maintained und located within th  1.  arian areas along a quare footage for e Riparian Area and % Riparian Area>	anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin Score for each ri	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating leparian category in 60%	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Congth and width. (and the blocks below 30%	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are processors of the condition of the condi	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure te of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5		cores*0.01)/2 0.72	CI
Condition Scores  Delineate rip secriptors. Determine so solow. Enter the %	with > 60% free oc onon-maintained unclocated within the located withi	anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri 10% 0.6	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating leparian category in 60%  0.85	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. (and the blocks below 30% 0.5	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are processors of the condition of the condi	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure te of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel olds, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100 100%	CI= (Sum % RA * Se		CI 0.69
Condition Scores  Delineate rip escriptors. Determine scelow. Enter the %  Right Bank  Left Bank  INSTREAL	with > 60% free cc non-maintained une located within th  1. arian areas along a uare footage for e Riparian Area and % Riparian Area> \$ Core >  % Riparian Area>	anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 10% 0.6  10% 0.6  aried substrate si	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating lee parian category in 60%  0.85  40%  0.85  zes, water velocit	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  ategories and Coungth and width. (and the blocks below 0.5  50%  0.5	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the control of th	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  ing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel olds, trails, or other comparable conditions.  Low 0.5  Les sums iparian qual 100 100%	CI= (Sum % RA * So Rt Bank CI >	0.72 0.65	
Condition Scores  Delineate rip escriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream	with > 60% free cc non-maintained und located within th  1.  arian areas along a quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Va root mats; SAV; r	anopy cover and a derstory. Wetlands le riparian areas.  5.5  each stream ban each by measurin Score for each ri 10% 0.6  10% 0.6  aried substrate si iffle poole comple	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating lee parian category in 60%  0.85  40%  0.85  zes, water velocit exes, stable features.	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  attegories and Coungth and width. (and the blocks below 0.5  50%  0.5  y and depths; wores.  Conditiona	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the condition of the condi	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree canopy cover with maintained understory.  Low  0.75  ing the povided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl > NOTES>> Area is cha with a lot o	0.72 0.65 annelized	
Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % Right Bank  Left Bank  Linstream Habitat/ Available	with > 60% free cc non-maintained und located within th  1.  arian areas along aguare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Core >  W HABITAT: Ware of the ware o	anopy cover and a derstory. Wetlands the riparian areas.  5  each stream ban each by measurin Score for each ri 10% 0.6  10% 0.6  aried substrate si iffle poole completimal are typically present	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating lee parian category in 60%  0.85  40%  0.85  zes, water velocit exes, stable feature Subol Stable habitate lepresent in 30-50%	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  ategories and Congth and width. (and the blocks below 0.5  y and depths; wores.  Conditiona ptimal ments are typically 6 of the reach and	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the control of th	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  ing the povided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks end Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, other confections.  Low 0.5  Low 0.5  100%  100%	Cl= (Sum % RA * Sc Rt Bank Cl > Lt Bank Cl > NOTES>> Area is cha with a lot o stormwatel	0.72 0.65 annelized	0.69
Condition Scores  Delineate rip secriptors. Determine scelow. Enter the %  Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/	with > 60% free oc onon-maintained unclocated within the located withi	anopy cover and a derstory. Wetlands he riparian areas.  5  each stream ban each by measurin  Score for each ri  10%  0.6  10%  0.6  aried substrate si iffle poole completifie poole completimal  imal  ire typically present 10% of the reach.	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating let parian category in 60%  0.85  40%  0.85  Zes, water velocitiexes, stable features, stable features are dequate for popul	Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Congth and width. (and the blocks below 0.5  50%  0.5  y and depths; wores.  Conditional primal ments are typically	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree canopy cover with maintained understory.  Low  0.75  ing the povided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks end Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel olds, trails, or other comparable conditions.  Low 0.5  The sums iparian qual 100 100%  100%  100%  Or listed above are stable. Habitat ally present in less the reach.	Cl= (Sum % RA * Sc Rt Bank Cl > Lt Bank Cl > NOTES>> Area is cha with a lot o stormwatel	0.72 0.65 annelized	

	St	ream Im	pact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	csx	VA	R2SB	02070010	10/15/2015	02-STR-52			
	L ALTERATION: Stream cross spoil piles, constrictions, livestock	ings, riprap, concre	ete, gabions, or o		straightening of ch	hannel, channeliz	ation,	NOTES>> Two large (railroad a	
	Negligible	Mino	or	Mode	erate	Sev	ere		nu access
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.		the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		Greater than 8 disrupted by any alterations listed guidelines AND/C shored with gal cem	y of the channel in the parameter DR 80% of banks bion, riprap, or	road)	
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5		
	REACH C	ONDITION IN	DEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH		
	RCI should be rounded to 2 decimal places. T	The CR should be rounde	ed to a whole number	er.			THE REACH	CONDITION IN	DEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

### INSERT PHOTOS:



Top Left: View upstream under railroad
Bottom Right: View downstream away from railroad

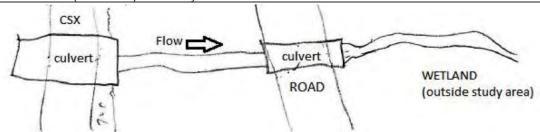
**NC DWQ Stream Identification Form Version 4.11** 

02-STR-52

Date: 10/19/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.647790
Evaluator: L. Eggering	County: Prince William	Longitude: -77.251102
<b>Total Points:</b> 36 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 18)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	(2)	3
ripple-pool sequence		-	$\overline{}$	
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	①	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	N	o = 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $8.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	= 3
C. Biology (Subtotal = $9.5$ )	<u> </u>			
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other method	ds. See p. 35 of manua			
Notes: This data point is in the stream near the ba			been channelized.	Stream terrace
is well drained (10YR 4/3). Tributary to Ma	•			

Sketch:



Class. length Factor	Class   Clas	DC2RVA - Area 02  R6 02070010  O2-STR-53  AN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal High Suboptimal Riparian areas along the entire stratum (dbh > 3 inches) present, with 30% (dbh > 3 inches) present, with	DC2RVA - Area 02 R6 02070010 DC2-STR-53  IAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal  High Suboptimal  Righard areas with tree stratum (dbh > 3 inches) present, present, with 50% (bhh > 3 inches) present, present, with 50% (bhh > 3 inches) present, present, with 50% (bhh > 3 inches) present, present, present, with 50% (bhh > 3 inches) present, present, present, with 50% (bhh > 3 inches) present, pr	DC2RVA - Area 02  R6  O2070010  D2-STR-53  RIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal  Buboptimal  High Suboptimal  Rigarian length  Rigarian length  (bh > 3 inches) present, ries dratum (bh > 3 inches) present, with real stratum (bh > 3 inches) and shrub layers or a normarianed understory.  Tree stratum (bh > 3 inches) present, with 50% tree canopy cover and shrub layers or a normarianed understory.  High Low  Recent cutower each stratum leads and stratuble stratum (bh > 3 inches) present, recently seeded and stratubles, or open water. If recently seeded and stratum layers or a new season and shrub layers or a new sequence footage for each by measuring or estimating length and width. Calculators are provided for you  8. Riparian Areas and Score for each riparian category in the blocks below.  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >> RCI = RCI X LF X IF	DC2RVA - Area 02 R6 02070010 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	DCRIVA - Area 02 R6 0207010	Project #		Project Name	•	For us Locality	e in ephemeral s Cowardin	HUC	Date	SAR#	Impact/SAR	Impact
Name(s) of Evaluator(s)  Stream Name and Information  O2-STR-53  IRIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal High Suboptimal Repartian areas with tree stratum (ofth > 3 inches) present, with 30% lenge canopy cover and shrub layers or a non-maintained areas.  The stratum (ofth > 3 inches) present, with 30% lenge canopy cover and shrub layers or a lenger (ofth > 3 inches) present, with 30% reactions (ofth) and inches of the stratum (ofth) and inches of the	Stream Name and Information  O2-STR-53  N BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Migh Suboptimal Reparain areas along the entire SAR. (rough measurements of length & width may be acceptable)  NOTES>> Field Sheet is missing information filled out from aerials with the stratum (dbh > 3 inches) present, with 30% (dbh > 3 inches) present, we getation).  NOTES>> Field Sheet is missing information filled out from aerials with 10% (dbh > 3 inches) present, we special and, and maintained area, present year of the spoil land, and an inches area and administration of the spoil and, and an inches area and a darks bisyers or a inches present, we cannopy cover with an inches present, we getation).  NOTES>> Field Sheet is missing information filled out from aerials and and missing information filled out from aerials and an inches area and an inches area and a south and an inches a	AN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal High Suboptimal: Riparian areas with the stratury (fish > 3 inches) present, (fish > 3 inches) present, with 30% see canopy cover and non-maintained understory. Wetlands of eas.  Tree stratum (dsh > 3 inches) present, with 30% see canopy cover and shrub layers or a non-maintained understory.  High Low H	AND BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal High Suboptimal Rearian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Rearian areas along the entire SAR. (rough measurements of length & width may be acceptable)  NOTES>> Field Sheet is missing information filled out from aerials with tree stratum, floth > 3 inches) present, with 50% free carry cover and antivol layers or a non-maintained understory.  It rise stratum (obh > 3 inches) present, with 50% free carry cover and antivol layers or a non-maintained understory.  It rise stratum (obh > 3 inches) present, with 50% free carry cover with non-maintained understory.  It rise stratum (obh > 3 inches) present, with 50% free carry cover with non-maintained understory.  It rise stratum (obh > 3 inches) present, with 50% free carry cover with non-maintained understory.  It rise stratum (obh > 3 inches) present, with 50% free carry cover with non-maintained understory.  It rise stratum (obh > 3 inches) present, with 50% free carry cover with non-maintained understory.  It rise stratum (obh > 3 inches) present, with 50% free carry cover with non-maintained understory.  It rise stratum (obh > 3 inches) present, with 50% free carry cover with non-maintained understory.  It rise stratum (obh > 3 inches) present, with 50% free carry cover with maintained understory.  It rise stratum (obh > 3 inches) present, with 50% free carry cover with rise stratum, have present (obh > 3 inches) present, with 50% free carry cover with rise stratum, have present (obh > 3 inches) present, with 50% free carry cover with rise stratum, have present (obh > 3 inches) present, with 50% free carry cover with rise stratum, have present (obh > 3 inches) present, with 50% free carry cover with rise stratum, have present (obh > 3 inches) present, with 50% free carry cover with rise around the	RIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Righ Suboptimat Righran areas  In Tree stratum (dbh > 3 inches) present, with 30% suboptimated areas.  Tree stratum (dbh > 3 inches) present, with 30% suboptimated areas.  Tree stratum (dbh > 3 inches) present, with 30% suboptimated areas.  High Marginal Areas and Score for each by measuring or estimating length and width. Calculators are provided for you and shrub grain areas along each stream bank into Condition Categories and Condition Scores using the  service of the stratum areas along each stream bank into Condition Category in the blocks below.  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Conditional Category   Suboptimal   Suboptimal   High Suboptimal   Right Suboptimal   R	Conditional Category   Suboptimal   Suboptimal   High Suboptimal   High Suboptimal   Rigarian areas with tree stratum (dbh > 3 inches) present, with 1 to 65% tree canopy cover and onn-maintained understory. Wellands areas.   High Marginal riches) present, with 1 to 65% tree canopy cover and onn-maintained understory.   Wellands areas.   High Low	Optimal Suboptimal High Suboptimal High Suboptimal Riparian areas with ree stratum (dbh > 3 inches) present, with > 60% free cancyoy cover and containing of the fraceous and shrub layers a consumer of the fraceous and shrub layers are said understory. Wetlands areas and sord stratum (dbh > 3 inches) present, with > 60% free cancyoy cover and containing demonstration of the fraceous and shrub layers at the early officers of non-maintained understory. Wetlands areas and sord stratum (dbh > 3 inches) present, with > 60% free cancyoy cover and containing fee cancyoy cover with cover and containing fee cancyoy cover and cont	Conditional Category   Suboptimal   Suboptimal   High Suboptimal   Right and areas with tree stratum (dth > 3 inches) present, with > 60% free canopy cover and a conditional pot herbaceous and shrub layers or a free from maintained understory. Welstands areas.   High Suboptimal   Welstand areas with tree stratum (dth > 3 inches) present, with > 60% free canopy cover and a condition pot herbaceous and shrub layers or a free inches) present, with > 60% free canopy cover and a condition pot mon-maintained understory.   Welstands areas.   High Murginal   Low Murginal   Welstands areas.   High Murginal   Low free stratum (dth > 3 inches) present, with > 60% free canopy cover and a condition pot mon-maintained understory.   Welstands areas along each stream bank into Condition Categories and Condition Scores using the equal form of the comparable conditions.   Welstands   W	Conditional Category   Suboptimal   Suboptimal   High Suboptimal   Right Suboptimal   R	Optimal Suboptimal Figure 1 and 1 an	Conditional Category	141	I RIIEEEDS: A	scoss both bank	de 100 foot riparie	on areas along the	o ontiro SAR (ros	ugh mooguromon	ts of longth & wid	th may be accept	table)	
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1.5 1.2 1.1 0.85 0.75 0.6 0.5  Ite riparian areas along each stream bank into Condition Categories and Condition Scores using the resquare footage for each by measuring or estimating length and width. Calculators are provided for you will be square footage for each riparian category in the blocks below.    Respective of % Riparian Area and Score for each riparian category in the blocks below.	1.5  1.2  1.1  0.85  0.75  0.6  0.5  In a reas along each stream bank into Condition Categories and Condition Scores using the pure footage for each by measuring or estimating length and width. Calculators are provided for you sharp and score for each riparian category in the blocks below.    Secore   1.1   0.6   Cl= (Sum % RA * Scores*0.01)/2   MRiparian Area   95%   5%   100%   100%   Rt Bank Cl > 1.08   1.08	1.5 1.2 1.1 0.85 0.75 0.6 0.5    parian areas along each stream bank into Condition Categories and Condition Scores using the square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Area and Score for each riparian category in the blocks below.    Riparian Area	Tiparian areas along each stream bank into Condition Categories and Condition Scores using the esquare footage for each by measuring or estimating length and width. Calculators are provided for you % Riparian Area and Score for each riparian category in the blocks below.    Score   1.1   0.6	1.5 1.2 1.1 0.85 0.75 0.6 0.5  Ite riparian areas along each stream bank into Condition Categories and Condition Scores using the resquare footage for each by measuring or estimating length and width. Calculators are provided for you will be square footage for each riparian category in the blocks below.    Respective of % Riparian Area and Score for each riparian category in the blocks below.	1.5 1.2 1.1 0.85 0.75 0.6 0.5  Iparian areas along each stream bank into Condition Categories and Condition Scores using the square footage for each by measuring or estimating length and width. Calculators are provided for you will sparian Area and Score for each riparian category in the blocks below.    Reparian Areas	In 1.5 1.2 1.1 0.85 0.75 0.6 0.5  Inparian areas along each etream bank into Condition Categories and Condition Scores using the sequence footage for each by measuring or estimating length and width. Calculators are provided for you Blocks equal 100		with > 60% tree car non-maintained und	nopy cover and an erstory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/bc/apress/reg/4">30 inches) present, with <a href="https://doi.org/40.100/bc/apress/reg/4">30 inches) present <a< td=""><td>Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh &gt;3 inches) present, with <a href="#"> with <a href="#"> yow maintained understory</a>  The stratum (dbh &gt;3 inches) present, with <a href="#"> with <a href="#"> yow maintained understory</a>  The stratum (dbh &gt;3 inches) present, and shrub (dbh &gt;3 inches) present, and shrub (dbh &gt;3 inches) present, and shrub (dbh &gt;3 inches) present (dbh &gt;3 inches) prese</a></a></td><td>Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.</td><td>Impervious surfaces, mine spoil lands, denuded surfaces row crops, active feed lots, trails, or other comparable conditions.</td><td>from aerials</td><td></td></a<></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a>	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a href="#"> with <a href="#"> yow maintained understory</a>  The stratum (dbh &gt;3 inches) present, with <a href="#"> with <a href="#"> yow maintained understory</a>  The stratum (dbh &gt;3 inches) present, and shrub (dbh &gt;3 inches) present, and shrub (dbh &gt;3 inches) present, and shrub (dbh &gt;3 inches) present (dbh &gt;3 inches) prese</a></a>	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces row crops, active feed lots, trails, or other comparable conditions.	from aerials	
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se square footage for each by measuring or estimating length and width. Calculators are provided for you  % Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100  Cl= (Sum % RA * Scores*0.01)/2  Score > 1.1 0.6  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	Riparian Area and Score for each riparian category in the blocks below.    Riparian Area   95%   5%   100%	square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian  6 Riparian Area and Score for each riparian category in the blocks below.    Score   1.1   0.6   100%	se square footage for each by measuring or estimating length and width. Calculators are provided for you  % Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100  Cl= (Sum % RA * Scores*0.01)/2  Score > 1.1 0.6  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	se square footage for each by measuring or estimating length and width. Calculators are provided for you  % Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100  Cl= (Sum % RA * Scores*0.01)/2  Score > 1.1 0.6  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	square footage for each by measuring or estimating length and width. Calculators are provided for you    Right	se square footage for each by measuring or estimating length and width. Calculators are provided for you by Riparian Area and Score for each riparian category in the blocks below.    No. Riparian Area and Score for each riparian category in the blocks below.   Blocks equal 100											
Score   Scor	Score >   1.1   0.6	Score   Scor	Score   Scor	Score   Scor	Score   1.1   0.6	Score   1.1   0.6	e sq	uare footage for ea	ach by measurin	g or estimating le	ngth and width. (	Calculators are pr	•	of % F	Riparian		
Cl= (Sum % RA * Scores*0.01)/2	Cl= (Sum % RA * Scores*0.01)/2   % Riparian Areas   95%   5%   100%   Rt Bank Cl > 1.08   Score > 1.1   0.6   Lt Bank Cl > 1.08   REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH   RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.   THE REACH CONDITION INDEX (RCl) >>	Cl= (Sum % RA * Scores*0.01)/2   % Riparian Area   95%   5%   100%   Rt Bank Cl > 1.08     Score > 1.1   0.6   Lt Bank Cl > 1.08     REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH     THE REACH CONDITION INDEX (RCl) >>     RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.   THE REACH CONDITION INDEX (RCl) >>     RCl = (Riparian Cl)/2     Compensation Requirement (CR) >>     CR = RCl X LF X IF	Cl= (Sum % RA * Scores*0.01)/2   K   % Riparian Area> 95% 5%	Cl= (Sum % RA * Scores*0.01)/2   Nk   % Riparian Area > 95%	Click   Sum % RA * Scores * 0.01)/2	Circ (Sum % RA * Scores* 0.01)/2		% Riparian Area>	95%	5%					100%	4	
Score > 1.1 0.6 Lt Bank Cl > 1.08  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCl) >>  RCl = (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCl X LF X IF	Score > 1.1 0.6 Lt Bank Cl > 1.08  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI = (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  d RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	Score > 1.1 0.6 Lt Bank Cl > 1.08  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCl) >>  RCl = (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCl X LF X IF	Score > 1.1 0.6 Lt Bank Cl > 1.08  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCl) >>  RCl = (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCl X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCIE (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  HOTOS:	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCIe (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  HOTOS:	nĸ	Score -	1.4	0.6							
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI = (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  d RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  Ind RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.    THE REACH CONDITION INDEX (RCI) >>   RCI= (Riparian CI)/2   COMPENSATION REQUIREMENT (CR) >>   CR = RCI X LF X IF     HOTOS:	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  Ind RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.    THE REACH CONDITION INDEX (RCI) >>   RCI= (Riparian CI)/2   COMPENSATION REQUIREMENT (CR) >>   CR = RCI X LF X IF     HOTOS:	к 	Score >	1.1	0.6						CI= (Sum % RA * So	cores*0.01)/2
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RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  HOTOS:	RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF		% Riparian Area>	95% 1.1	5% 0.6	AIDEV and O	TREAM COL	NOTION III	ITO FOR TH		Rt Bank CI >	1.08
CR = RCI X LF X IF	HOTOS:  CR = RCI X LF X IF	CR = RCI X LF X IF	k	% Riparian Area> Score >	95% 1.1 REACH C	5% 0.6 ONDITION II			NDITION UN	ITS FOR TH	IS REACH	Rt Bank CI >	1.08				
					HOTOS:	HOTOS:	nk	% Riparian Area> Score >	95% 1.1 REACH C	5% 0.6 ONDITION II			NDITION UN	ITS FOR TH	IS REACH	Rt Bank CI >  Lt Bank CI >	1.08 1.08 EX (RCI) >>
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BE PROPOSED IMPACT:	PROPOSED IMPACT:	PROPOSED IMPACT:	E PROPOSED IMPACT:				nk and F	% Riparian Area> Score >  CI should be rounded to	95% 1.1  REACH C o 2 decimal places.	5% 0.6 ONDITION II			NDITION UN		IS REACH THE REACH	Rt Bank CI > Lt Bank CI >  CONDITION IND CI= (Riparian CI) ION REQUIREM	1.08 1.08 EX (RCI) >>

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Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date:

02-STR-53

Latitude:

Evaluator:	County: Prince	William	Longitude:	
<b>Total Points:</b> 0 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determ Ephemeral Inte	ination (circle one) ermittent Perennial	Other e.g. Quad Name:	
			•	
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1 <sup>a</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,				-
ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal =)		T T		
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes :	= 3
C. Biology (Subtotal =)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OE	BL = 1.5 Other = 0	)
*perennial streams may also be identified using other methods		al.		
Notes: NC data for this resource not available (no f	ield sheets).			
Sketch:				
Cheton.				

				fied Stream N						
Droinst #		Droject Nave		wadeable chan	nels classified a Cowardin			CAD#	Impact/SAR	Impact
Project #		Project Name		Locality	Class.	HUC	Date	SAR#	length	Factor
N/A		2RVA - Area		VA	R2SB	02070010	10/20/2015			
Nam	ne(s) of Evalua L. Eggering	. ,	otream Nam	e and Informa	ατιΟΠ	02-57	ΓR-54			
Channel (	Condition: Asse		tion of the stream	n and prevailing or	ondition (erosion		1174			
Jumror C		imal			Conditional Catego		Po	or	Sev	oro
	Opti	iiiai	Subo	Pullai	iviar	girlai	70		Sev	G1 C
		Who have	Cliability			less than Severe or stable than Severe	Overwidene Vertically/laterally		1	5
Channel Condition	100% stable bal surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully	n or natural rock, 00%). AND/OR /bankfull benches ess to their original	erosion or unproted of banks are s Vegetative protect prominent (60- Depositional feat stability. The bar channels are we likely has access to	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches,	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute	widen further. Major are near vertical. E 60-80% of bant protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp	ority of both banks rosion present on its. Vegetative at on 20-40% of ficient to prevent a 60-80% of the d by sediment.	incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sk	stability. Severe tained within the delow average ajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present.
	and transverse ba sediment depositio 10% of	ars few. Transient on covers less than	portions of the r sediment cover	ed floodplains along reach. Transient rs 10-40% of the bottom.	stability, may be AND/OR V-shap vegetative protecti banks and depositi	on that contribute to forming/present. ed channels have on on > 40% of the ional features which to stability.	nature, and contrib AND/OR V-shape vegetative protection 40% of the barn sediment depos	d channels have on is present on > ks and stable	Erosion/raw ban AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	ks on 80-100%. g channel. Greater bed is covered by uting to instability. channels and/or
Score	3	3	2	2.4		2	1.	6	1	
			•				eatherstor	_		
	N BUFFERS: A	Assess both bank	c's 100 foot riparia		e entire SAR. (ro			h may be accep	table)	Large
RIPARIAI Riparian Buffers	Opti	Assess both bank imal  > 3 inches) present, and derstory. Wetlands	Con Subo  Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ripanian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	table)	wetland
RIPARIAI Riparian Buffers Condition	Tree stratum (dbh : with > 60% tree cc non-maintained una located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	an areas along the ditional Categorium Categ	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, radiative stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> floodplain on both sic	wetland
Riparian Buffers  Condition Scores Delineate rip secriptors. Determine selow.	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin Score for each r 100%	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Coungth and width. Coungth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, radiative stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> floodplain on both sic	wetland
Riparian Buffers  Condition Scores Delineate rip escriptors. Determine stelow. Enter the %	Tree stratum (dbh with > 60% tree conon-maintained un located within the located within t	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Coungth and width. Coungth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, radiative stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> floodplain on both sic stream.	wetland les of the
Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine scolow. Enter the %  Right Bank	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5  each stream ban each by measurin Score for each r 100% 1.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Coungth and width. Coungth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, radiative stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> floodplain on both sic stream.  Cl= (Sum % RA * S Rt Bank Cl >	wetland les of the
Riparian Buffers  Condition Scores Delineate rip secriptors. Determine selow. Enter the % Right Bank  Left Bank  INSTREAI	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5.5  each stream ban each by measurin  Score for each r  100%  1.5  1100%  1.5  arried substrate si iffte poole comple	Con Subo  Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  K into Condition C g or estimating leeparian category in the parian category	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below t	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided to the condition of the condition	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (bdh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	Its of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> floodplain on both sic stream.	wetland les of the  cores*0.01)/2 1.50 1.50 Tidally
Riparian Buffers  Condition Scores Delineate rip secriptors. Determine selow. Enter the % Right Bank  Left Bank	Tree stratum (dbh : with > 60% tree cc conon-maintained und located within the located wi	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5.5  each stream ban each by measurin  Score for each r  100%  1.5  1100%  1.5  arried substrate si fifte poole completimal  re typically present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (an the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies the seeded and stabilized and stabilize	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%	Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	wetland les of the  cores*0.01)/2 1.50 1.50 Tidally

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Impact Factor Project # Date R2SB 02070010 10/12/2015 02-STR-54 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> Conditional Category Moderate embankments, spoil piles, constrictions, livestock Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is the parameter guidelines. If stream has been disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed i srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. SCORE 1.5 0.5 1.3 1.1 0.9 0.7 1.30 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe RCI= (Sum of all CI's)/5

#### INSERT PHOTOS:





Top Left: View upstream under railroad Top Right: Typical view downstream away from railroad Bottom Left: Typical view downstream away from railroad

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

NC DWO Stream Identification Form Version 4.11

**Farm Creek** 

02-STR-54

Date: 10/20/2015 Project/Site: DC2RVA - Area 02 Latitude: 38,625443 Evaluator: L. Eggering, W. Moorhead County: Prince William Longitude: -77.251297 Total Points: 41 Stream Determination (circle one) Other Stream is at least intermittent Ephemeral Intermittent Perennial e.g. Quad Name: if ≥ 19 or perennial if ≥ 30\* Strong **Absent** Weak Moderate A. Geomorphology (Subtotal = 193 1<sup>a.</sup> Continuity of channel bed and bank 0 1 2. Sinuosity of channel along thalweg 0 1  $\bigcirc$ 3 3. In-channel structure: ex. riffle-pool, step-pool, 0 1 3 2 ripple-pool sequence 1 4. Particle size of stream substrate 0 2 3 5. Active/relict floodplain 0 2 1 6. Depositional bars or benches 0 2 3 7. Recent alluvial deposits 0 2 0 8. Headcuts 2 3 0.5 9. Grade control 1 10. Natural valley 0 0.5 1 1.5 11. Second or greater order channel No = 0Yes = 3artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 9.512. Presence of Baseflow 2 (3) 1 0 13. Iron oxidizing bacteria 2 1 3 14. Leaf litter 1 0.5 0 15. Sediment on plants or debris 0.5 1 (1.5)16. Organic debris lines or piles 0.5 1 1.5 17. Soil-based evidence of high water table? No = 0Yes = 3C. Biology (Subtotal = 12.5 18. Fibrous roots in streambed 2 3 19. Rooted upland plants in streambed 1 20. Macrobenthos (note diversity and abundance) 2 (3) 1 0 21. Aquatic Mollusks 1 2 22. Fish 0.5 1 1.5 23. Crayfish 0 0.5 1.5 24. Amphibians 0 0.5 1.5 25. Algae 0 0.5 1.5 FACW = 0.75; OBL = 1.5 Other = 0 26. Wetland plants in streambed \*perennial streams may also be identified using other methods. See p. 35 of manual. Notes: Tidally affected, therefore no riffles. Field Sheet: 04-A-STR-02, Farm Creek in Featherstone NWR. Sketch:

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Impact Cowardin Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 02 02070010 10/20/2015 1 Stream Name and Information Name(s) of Evaluator(s) W. Moorhead, L. Eggering 02-STR-55 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** Optimal Field Sheet: 04-A-STR-Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: Lawns, mowed 03 100' downstream. ligh Suboptima High Marginal: Riparian areas ense herbaceou Riparian areas and maintained Low Poor: vegetation, riparian areas with tree stratur Non-maintained with tree stratun reas, nurseries (dbh > 3 inches ense herhaceou (dbh > 3 inches) no-till cropland present, with acking shrub and Tree stratum (dbh > 3 inches) presen spoil lands, resent, with 309 actively grazed Riparian either a shrub 30% tree canon tree stratum, hav pasture, sparsely vegetated non-maintained area, to 60% tree with > 60% tree canopy cover and ar enuded surface cover and a maintained roduction, ponds open water. If laver or a tree canopy cover an containing both row crops, active eed lots, trails, or **Buffers** on-maintained understory. Wetland layer (dbh > 3 inches) present, understory present, tree herbaceous and recently seeded ther comparable Recent cutove with <30% tree stratum (dbh >3 shrub layers or a non-maintained and stabilized, o conditions. (dense vegetation). canopy cover. inches) present, with <30% tree understory canopy cover with maintained High High High Low Low Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 50% 50% 100% Right Bank 0.6 1.5 Score > CI= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> 50% 50% 100% Rt Bank CI > 1.05 CI Left Bank 1.05 1.05 Score > 1.5 0.6 Lt Bank CI >

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF

0.53

**INSERT PHOTOS:** 



NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

Typical view upstream, toward railroad of ephemeral channel

D	ES	CRI	BE	PR(	OPC	SE	D IN	1PA	CT:

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 10/20/2015

02-STR-55

Latitude: 38.614944

Evaluator: L. Eggering, W. Moorhead	County: Prince	William	Longitude: -77	7.252864
<b>Total Points:</b> 10 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name	:
A. Geomorphology (Subtotal = 4)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $1.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0 -	0.5	1	1.5
17. Soil-based evidence of high water table?		0 = 0	Yes	
C. Biology (Subtotal = 4.5				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	<u>(3)</u>	2		0
20. Macrobenthos (note diversity and abundance)	<u> </u>	1	2	3
21. Aquatic Mollusks		1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	0.5	<u>.</u> 1	1.5
24. Amphibians	0	0.5	<u>.</u> 1	1.5
25. Algae	$\tilde{O}$	0.5	<u>.</u> 1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB		
*perennial streams may also be identified using other method	ls See n 35 of manua		L = 1.0 Other = 1	
Notes: Ephemeral channel from former culvert with			eld Sheet: 04-A-	STR-03
Trotog. =priorita original remains a surface and the	op og	anda min granom m		
Sketch:				

		Stre		SSESS			(For	m 1)			
				wadeable chan					Impost/SAD	Impost	
Project #	I	Project Name	•	Locality	Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	02	VA	R1UB	02070010					
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa		TD 50					
1.01	N 1141					<u> </u>	Neabsco (	Creek)			
i. Channel C	Condition: Asse			C	onditional Catego	ry	_		-		
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	-	AND SHAPE	3	No.		less than Severe or	Overwiden		1	5	
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	n or natural rock, 00%). AND/OR bankfull benches as to their original developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	ew areas of active toted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, of floodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe ewer bank slopes. seent on 40-60% of tative protection on Streambanks may creut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	Vertically/laterally widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/OI stream is cover Sediment is temp nature, and contril AND/OR V-shape	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the bed by sediment. orary/transient in outing to instability.	Deeply incised vertical/lateral ininicision, flow con banks. Streambe rooting depth, m vertical/lunderc protection present c banks, is not pre Obvious bank sit. Erosion/raw ban AND/OR Aggrading	stability. Severe tained within the do below average tajority of banks ut. Vegetative in less than 20% of venting erosion. Dughing present. ks on 80-100%.	
	sediment depositio	n covers less than bottom.	sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protecti 40% of the bar sediment depos	iks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	.4	:	2	1.	6	1		2.4
								m aerials.			
2. RIPARIAN	N BUFFERS: A		Con	ditional Cate	gory			h may be accep	table)		
2. RIPARIAN Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	imal  3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the	imal 3 inches) present, anopy cover and a derstory. Wellands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">30% tree canopy cover.</a> High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian	Opti  Tree stratum (dbh - with > 60% tree ca	imal 3 inches) present, anopy cover and a derstory. Wellands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate ripatescriptors. 2. Determine scoelelow.	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the	imal  - 3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate ripalescriptors. 2. Determine scopelow.	Tree stratum (dbh > with > 60% tree cc conon-maintained und located within the located wi	imal 3 inches) present, anopy cover and a terstory. Wellands e riparian areas.  5  each stream band ach by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rips descriptors. 2. Determine scoelow. 3. Enter the % F	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	imal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5 each stream banl ach by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100		cores*0.01)/2	
Riparian Buffers  Condition Scores  1. Delineate rips descriptors. 2. Determine scoelow. 3. Enter the % F	Tree stratum (dbh > with > 60% tree conon-maintained unclocated within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands eriparian areas.  5  each stream bani ach by measurin  Score for each ri  100%  1.1  30%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	NOTES>>  CI≕ (Sum % RA * Si  Rt Bank CI >	1.10	CI
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Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % f	Tree stratum (dbh > with > 60% tree conon-maintained unclocated within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands er iparian areas.  5  each stream banl ach by measurin 100% 1.1 30% 1.1 aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  70% 0.5	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Academic Scores us Calculators are proving the street of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5	NOTES>>  CI≕ (Sum % RA * Si  Rt Bank CI >	1.10	CI
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	Tree stratum (dbh > with > 60% tree ca non-maintained une located within the located with	imal  3 inches) present, anopy cover and a lerstory. Wetlands e riparian areas.  5  ach stream band ach by measurin  100%  1.1  30%  1.1  aried substrate si fffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  70% 0.5  zes, water velocit exes, stable feature	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	1.10	CI
Condition Scores  1. Delineate rip: descriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/ Available	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	imal  3 inches) present, anopy cover and a ferstory. Wetlands e riparian areas.  5  ach stream bank ach by measurin 100% 1.1 30% 1.1 aried substrate si fifte poole completimal re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  70% 0.5  zes, water velocit exes, stable featur  Subo  Stable habitat elpresent in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Acalculators are provided in Category  w.  Stable habitate layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically 6 of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks end  Habitat elements lacking or are ur	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	1.10	CI
Riparian Buffers  Condition Scores  1. Delineate ripa descriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree co non-maintained und located within the located with	imal  3 inches) present, anopy cover and a ferstory. Wetlands e riparian areas.  5  ach stream bank ach by measurin 100% 1.1 30% 1.1 aried substrate si fifte poole completimal re typically present	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  70% 0.5  zes, water velocit exes, stable featur  Suboy  Stable habitat ele present in 30-50% are adequate fo	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the properties of the blocks below the	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/">https://doi.org/10.100/j.nc/</a> High  0.85  Calculators are provided and leafy determined by and l	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, necently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to discuss the seeded and stabilized a	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	1.10	CI

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Date Data Point SAR length Project # Impact Factor R1UB 02070010 02-STR-56 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> Conditional Category Moderate embankments, spoil piles, constrictions, livestock Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach is disrupted by any of the channel alterations listed in stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. SCORE 1.5 0.5 1.3 1.1 0.9 0.7

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

#### **INSERT PHOTOS:**





Top Left: Typical view of stream with

sand bars and fringe wetland Top Right: Typical view of stream toward

railroad bridge with sand

bar and fringe wetland

Top Right: Typical view of stream

toward railroad bridge with sand bar and fringe wetland

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date:

02-STR-56

Latitude:

Evaluator:	County: Prince	William	Longitude:	
<b>Total Points:</b> 0 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermitten Perennia		
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal =)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	o = 0	Yes:	= 3
C. Biology (Subtotal =)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; O	BL = 1.5 Other = 0	)
*perennial streams may also be identified using other methods		al.		
Notes: NC data for this resource not available (no f	ield sheets).			
Sketch:				

		Stre	Unit	fied Stream M	lethodology f	or use in Virg		m 1)		
Project #		Project Name		wadeable channel	Cowardin	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact
N/A	DC	2RVA - Area	02	VA	Class. R4SB	02070011	10/22/2015		length	Factor
	e(s) of Evaluat		-	e and Informa		02070011	10/22/2013			
	ering, W. Mo	. ,				02-S	ΓR-57			
. Channel C	Condition: Asse	ess the cross-sec	tion of the stream	n and prevailing co	ondition (erosion,	aggradation)				
	Opti	imal	Subo	ptimal c	onditional Categor	ry ginal	Po	or	Sev	ere
	· J	NAME OF THE PROPERTY OF THE PR	3		Often incised, but I	less than Severe or	Overwiden	ed/incised.	1	5
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-11 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba sediment depositio	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches as to their original of developed wide Mid-channel bars, ars few. Transient in covers less than	erosion or unproted of banks are sit Vegetative protect prominent (60- Depositional feat stabReility. The bachannels are well likely has access to or newly develope portions of the re- sediment cover	ew areas of active cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to ankfull and low flow il defined. Stream o bankfull benches, d floodplains along reach. Transient rs 10-40% of the	or Poor due to lo Erosion may be pro both banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sec temporary/trans instability. Depositic stability, may be AND/OR V-shapi	stable than Severe wer bank slopes. sesent on 40-60% of tative protection on Streambanks may rout. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present. ed channels have on on > 40% of the	Vertically/laterally widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insus erosion. AND/Of stream is covere Sediment is temp nature, and contrit AND/OR V-shap vegetative protections of the bar widen and contrit and contrit of the sediment of the sed	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent 6 60-80% of the by sediment. orary/transient in puting to instability, d channels have on is present on >	vertical/lateral ir incision, flow coo banks. Streamb rooting depth, n vertical/under protection present banks, is not pre Obvious bank sl Erosion/raw ban AND/OR Aggradin than 80% of stream	g channel. Greater n bed is covered by
			stream	bottom.	banks and depositi	onal features which to stability.	sediment depos		deposition, contrit Multiple thread subterrar	channels and/or
Score	3	3	2	.4	:	2	1.	6		
. RIPARIAI	N BUFFERS: A	Assess both bank	's 100 foot riparia	an areas along the	entire SAR (ro	idh measiiremen	ts of length & wid	eld Sheet:		
. RIPARIAI	N BUFFERS: A		Con	an areas along the ditional Category	gory	ugh measuremen	ts of length & wid	h may be accep	otable)	Left
. RIPARIAI Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	imal  3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy	gory		High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	h may be accep	NOTES>> bank, near steep cut s forest, mai railroad R0 beyond tha	Left est 20' is slope with ntained DW
Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	imal 3 inches) present, anopy cover and a letrstory. Wellands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feec lots, trails, or other comparable conditions.	NOTES>> bank, near steep cut s forest, mai railroad R0 beyond tha	Left est 20' is slope with ntained DW
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine so	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	imal 3 inches) present, anopy cover and a derstory. Wellands e riparian areas.  5  each stream ban ach by measuring Score for each r	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorium Low Suboptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feec lots, trails, or other comparable conditions.  Low 0.5	NOTES>> bank, near steep cut s forest, mai railroad R0 beyond tha	Left est 20' is slope with ntained DW
Condition Scores Delineate ripescriptors. Determine scelow. Enter the %	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	imal  3 inches) present, anopy cover and a defension. Wellands e riparian areas.  5  each stream ban ach by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorium Low Suboptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feec lots, trails, or other comparable conditions.  Low 0.5	NOTES>> bank, near steep cut s forest, mai railroad R0 beyond tha	Left est 20' is slope with ntained DW at.
Riparian Buffers  Condition Scores Delineate rip secriptors. Determine scelow. Enter the %	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	imal 3 inches) present, anopy cover and a derstory. Wellands e riparian areas.  5  each stream ban ach by measuring Score for each r	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorium Low Suboptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feec lots, trails, or other comparable conditions.  Low 0.5	NOTES>> bank, near steep cut s forest, mai railroad RO beyond tha	Left est 20' is slope with ntained DW at.
Riparian Buffers  Condition Scores  Delineate rip secriptors. Determine scelow. Enter the %  Right Bank	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	imal 3 inches) present, anopy cover and a distribution with a series of the series of	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are proven.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5	NOTES>> bank, near steep cut s forest, mai railroad RC beyond tha	Left est 20' is slope with ntained DW at.
Condition Scores  Delineate ripescriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	5  seach stream ban ach by measurin 100% 1.5  20% 1.2  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) posent with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  80% 0.5	ditional Categotimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are proven.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5	ctable)  NOTES>> bank, near steep cut storest, mai railroad RC beyond that steep cut storest.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	Left est 20' is slope with ntained DW at.
Condition Scores  Delineate rip secriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAI	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	5  sach stream ban sach by measurin 100% 1.5  20% 1.2  arried substrate siffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  80% 0.5  zes, water velocit exes, stable feature	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Acalculators are proved the control of the cont	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	ctable)  NOTES>> bank, near steep cut storest, mai railroad RC beyond that steep cut storest.  Cl= (Sum % RA * Stream & Rt Bank Cl >  NOTES>> Stream all	Left est 20' is slope with ntained DW at.
Condition Scores  Delineate ripescriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	5  sach stream ban ach by measurin Score for each r 100% 1.5  20% 1.2  aried substrate si ffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  80% 0.5  zes, water velocit exes, stable featur  Subo  Stable habitat ele present in 30-509 are adequate fo	ditional Categotimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. Co n the blocks belov  by and depths; wores.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl> Some dives	Left est 20' is slope with ntained DW at.

	St	ream In	npact A	ssessm	ent For	m Pag	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R4SB	02070011	10/15/2015	02-STR-57			
4. CHANNEI	L ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of cl	hannel, channeliz	ation,	NOTES>>		
embankments, s	poil piles, constrictions, livestock		Conditiona						bottom of	
	Negligible	Mi	nor		erate	Sev	rere	old V-shap made ravii		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0 shored with ga	10% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or eent.	made ravii	ic.	CI
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			0.70
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			
NOTE: The CIs and R	RCI should be rounded to 2 decimal places. T	he CR should be roun	ded to a whole numb	er.				CONDITION IN		
								I= (Sum of all C		^
								ION REQUIRE	VIENI (CK) >>	0
INSERT PHO	TOC.						OR = RO	IXLI XII		İ
DESCRIBE F	PROPOSED IMPACT:									
DESCRIBE F	ROPOSED IMPACT:									

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 10/22/2015

02-STR-57

Latitude: 38.590508

William	Longitude: -77	7.260478
nination (circle one) ermittent Perennial	Other e.g. Quad Name:	
Weak	Moderate	Strong
(1)	2	3
(1)	2	3
0	2	3
(1)	2	3
0	2	3
(1)	2	3
The state of the	2	3
1	2	3
0.5	1	1.5
0.5	1	1.5
lo = 0	Yes:	= 3
1	2	(3)
1	2	(3)
1	0.5	(0)
0.5	1	1.5
0.5	1	1.5
lo = 0	Yes :	
2	(1)	0
2	1	0
(1)	2	3
1	2	3
0.5	1	1.5
0.5	1	1.5
0.5	1	1.5
0.5	1	1.5
FACW = 0.75; OB	L = 1.5 Other = 0	
al.		
ed, eroded banks. Fi	eld Sheet: 04-A-	STR-02SP // to

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Impact Cowardin Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 02 02070011 1 Stream Name and Information Name(s) of Evaluator(s) 02-STR-58 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Field Sheet is missing. Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: Lawns, mowed information filled out ligh Suboptima High Marginal: from aerials Riparian areas ense herbaceou Riparian areas and maintained Low Poor: vegetation, riparian areas with tree stratum Non-maintained with tree stratur areas, nurseries (dbh > 3 inches) ense herhaceou (dbh > 3 inches) no-till cropland present, with acking shrub and Tree stratum (dbh > 3 inches) presen spoil lands, present, with 30% actively grazed Riparian either a shrub 30% tree canon tree stratum, hav pasture, sparsely vegetated non-maintained area, to 60% tree with > 60% tree canopy cover and ar enuded surface cover and a maintained roduction, ponds open water. If laver or a tree canopy cover an containing both row crops, active eed lots, trails, or **Buffers** non-maintained understory. Wetland layer (dbh > 3 inches) present, understory. present, tree herbaceous and recently seeded ther comparable Recent cutover with <30% tree stratum (dbh >3 shrub layers or a non-maintained and stabilized, o conditions. (dense vegetation). canopy cover. inches) present, with <30% tree her comparable condition. understory canopy cover with maintained High High High Low Low Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank 1.1 Score > CI= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> 30% **70**% 100% Rt Bank CI > 1.10 CI Left Bank 0.5 0.68 0.89 Score > 1.1 Lt Bank CI > REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number THE REACH CONDITION INDEX (RCI) >> 0.45 RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF **INSERT PHOTOS:** DESCRIBE PROPOSED IMPACT:

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date:

02-STR-58

Latitude:

Evaluator:	County: Prince	William	Longitude:	
Total Points: 0 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determ Ephemeral Inte	ination (circle one) ermittent Perennial	Other e.g. Quad Name:	
·			•	
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence				
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel  a artificial ditches are not rated; see discussions in manual	N	0 = 0	Yes:	= 3
B. Hydrology (Subtotal =)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	 1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes :	
C. Biology (Subtotal =)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OF	BL = 1.5 Other = 0	)
*perennial streams may also be identified using other methods	. See p. 35 of manua	al.		
Notes: NC data for this resource not available (no f	ield sheets).			
Sketch:				

						or use in Virg				
Project #		Project Name		Locality	Cowardin	HUC	perennial Date	SAR#	Impact/SAR	Impact
•					Class.			JAN#	length	Factor
N/A Nam	DC ne(s) of Evalua	2RVA - Area tor(s)		VA e and Informa	R4SB ation	02070011	10/22/15			
	ering, W. Mo	. ,	-1.03.11 110111			02-S1	ΓR-59			
Channel C	Condition: Asse	ess the cross-sec	tion of the stream							
	Opti	imal	Subo	ptimal	Conditional Catego Mar	ry ginal	Po	or	Sev	ere
	1	- N				less than Severe or stable than Severe	Overwiden Vertically/laterally		1	5
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/	n or natural rock, 00%). AND/OR bankfull benches as to their original developed wide Mid-channel bars, ars few. Transient	erosion or unproter of banks are s Vegetative protect prominent (60 Depositional feat stabReility. The bachannels are we likely has access to or newly develope portions of the r	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to ankfull and low flow II defined. Stream to bankfull benches, of floodplains along reach. Transient	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran instability. Depositi stability, may be	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be issient, contribute on that contribute to forming/present.	well transplant and the state of the state o	ority of both banks rosion present on ks. Vegetative to no 20-40% of fficient to prevent 6 60-80% of the dby sediment. orary/transient in outing to instability.	Deeply incised vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present chanks, is not pre Obvious bank slt Erosion/raw ban AND/OR Aggradin.	stability. Severe tained within the do below average apority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%.
	10% of			rs 10-40% of the bottom.	vegetative protecti banks and deposit	ed channels have ion on > 40% of the ional features which to stability.	40% of the bar sediment depos	iks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	uting to instability. channels and/or
Score	3	3	2	.4		2	1.	6	1	
NOTES>>	N BUFFERS: A	•	·	• •	·				et 04-STR-0	1sp
		Assess both bank	c's 100 foot riparia	• •	e entire SAR. (ro	ugh measuremen <mark>ginal</mark>		h may be accep	notes>> 100% matu	re forest
	Opti	Assess both bank imal  - 3 inches) present, nover and a derstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ugh measuremen	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	h may be accep	table)	re forest
RIPARIAI Riparian Buffers Condition	Opti  Tree stratum (dbh > with > 60% tree co. non-maintained un	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	e entire SAR. (ro  GOTY  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	notes>> 100% matu	re forest
Riparian Buffers  Condition Scores  Delineate ripascriptors. Determine scolow.	Opti Tree stratum (dbh: with > 60% tree conon-maintained unclocated within the  1.  arian areas along of quare footage for e	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (displayed)	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, twee stratum (30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	notes>> 100% matu	re forest
Riparian Buffers  Condition Scores Delineate ripescriptors. Determine scalow. Enter the % I	Tree stratum (dbh with > 60% tree canon-maintained un located within th	Assess both bank  imal  3 inches) present, anopy cover and a dierstory. Wetlands e riparian areas.  5  each stream ban each by measurin Score for each r 100% 1.5	Con Subo High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (displayed)	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, twee stratum (30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Les sums iparian qual 100  100%	NOTES>> 100% matu (trees >3" I	re forest DBH).
Riparian Buffers  Condition Scores Delineate ripescriptors. Determine scalow. Enter the % I	Opti  Tree stratum (dbh: with > 60% tree conon-maintained un located within the carrian areas along quare footage for e	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin Score for each r 100% 1.5	Con Subo High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (displayed)	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, twee stratum (30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums iparian qual 100	NOTES>> 100% matu (trees >3" I	re forest OBH).
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scolow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/	Tree stratum (dbh with > 60% tree canon-maintained un located within th	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5.5  each stream ban each by measuring the stream bank and by measuring the stream bank and by the stream b	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  parian category in  zes, water velocit exes, stable featu	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (6th > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5   NOTES>> 100% matu (trees >3" I	re forest OBH).	
Riparian Buffers  Condition Scores Delineate ripscriptors. Determine scolow. Enter the % I Right Bank Left Bank LINSTREAI ndercut banks; Instream	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5.5  each stream ban each by measuring the stream bank and by measuring the stream bank and by the stream b	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (6th > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	CI= (Sum % RA * S Rt Bank CI > Ltt Bank CI > NOTES>> Little habit diversity, s	re forest DBH).

	St	ream In	npact A	ssessm	ent For	m Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R4SB	02070011	10/22/15	02-STR-59			
4. CHANNEL	_ ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of ch	nannel, channeliz	zation,	NOTES>>		
embankments, s	poil piles, constrictions, livestock		Conditiona					Channel p		
	Negligible	Mi	nor		erate	Sev	vere	straighten railroad lo		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	disrupted by an alterations listed guidelines AND/0 shored with ga	10% of reach is y of the channel in the parameter DR 80% of banks ubion, riprap, or nent.	raiiroad io	ng ago.	CI
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			1.30
	REACH CO	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IIS REACH			
NOTE: The CIs and R	CI should be rounded to 2 decimal places. T	he CR should be roun	nded to a whole number	er.				CONDITION IN		
								I= (Sum of all C		
								ION REQUIRE	ri⊏NI(CK)>>	0
INSERT PHO	TOC.						OR = RO	IX LI XII		1
DESCRIBE F	PROPOSED IMPACT:									

NC DWO Stream Identification Form Version 4.11

02-STR-59

Date: 10/22/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.589861
Evaluator: L. Eggering, W. Moorhead	County: Prince William	Longitude: -77.260833
Total Points: 29 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:
A Geomorphology (Subtotal – 13	Absent Weak	Moderate Strong

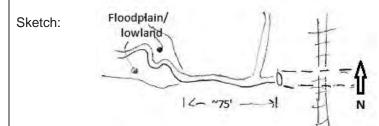
Absent	Weak	Moderate	Strong
0	1	2	(3)
0	1	(2)	3
0	1	2	3
0	(1)	2	3
0	1	2	3
0	(1)	2	3
0	1	2	3
0	1	2	3
0	0.5	1	1.5
0	0.5	1	1.5
<b>(</b> N	0 = 0	Yes :	= 3
0	1	2	3
0	1	2	(3)
1.5	1	0.5	<b>(3)</b>
0	0.5	1	1.5
	0.5	1	1.5
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	0 1 2 0 1 2 0 0 1 2 0 0 1 2 0 0 1 2 0 0 5 1 Ves:

12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	(3)
14. Leaf litter	1.5	1	0.5	(B)
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	lo = 0	Yes:	= 3
C Biology (Subtotal = 7			•	

C. Biology (Subtotal = 7				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	)>(	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	°	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other = 0	$\overline{}$

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: First order stream, grade appears to be controlled by clay layer, 04-A-STR-01sp



		Stre		fied Stream M	lethodology f	or use in Virg	ginia				
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	02	VA	R1UB	02070011			iciigai	1 dotoi	
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
					02-S	TR-60 (	Powells (	Creek)			
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opti	imal	Subo	ptimal c	onditional Catego	<sub>ry</sub> ginal	Po	or	Sev	ere	
	1	L MAR	1			less than Severe or	Overwiden		1	5	
Channel Condition	stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or full) bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 00%). AND/OR /bankfull benches ses to their original y developed wide Mid-channel bars,	erosion or unproter of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to or newly develope portions of the r	tion or natural rock -80%) AND/OR tures contribute to kfull and low flow Il defined. Stream o bankfull benches, d floodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositiv stability, may be	stable than Severe wer bank slopes. essent on 40-60% of tative protection on Streambanks may errout. AND/OR 40- in is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/OI stream is covere Sediment is temp nature, and contrit AND/OR V-shape	ority of both banks crosion present on ks. Vegetative nt on 20-40% of ffficient to prevent R 60-80% of the ab ysediment. orary/transient in puting to instability. ed channels have	Deeply incised vertical/lateral ininicision, flow con banks. Streambe rooting depth, m vertical/lunderc protection present c banks, is not pre Obvious bank sit Erosion/raw ban AND/OR Aggrading	stability. Severe tained within the do below average tajority of banks ut. Vegetative in less than 20% of venting erosion. Sughing present. It is on 80-100%.	
	10% of			rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depos	ks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	uting to instability. channels and/or	С
Score	3	3	2	.4	:	2	1.	6	1		2.4
NOTES>>	I DUEEEDO.				-			m aerials.			
	N BUFFERS: A		c's 100 foot riparia		e entire SAR. (roo			h may be accep	notes>>		
	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & wid	h may be accep			
2. RIPARIAN Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or			
2. RIPARIAN	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate ripr descriptors. 2. Determine scopelow.	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  .5  each stream bank each by measurin Score for each ries and seach stream bank each by measurin score for each ries and seach stream bank each by measurin score for each ries and seach stream bank each each stream bank each each stream bank each each each each each each each each	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dispense)	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100			
Riparian Buffers  Condition Scores  1. Delineate ripr descriptors. 2. Determine scorelow.	Tree stratum (dbh : with > 60% tree cc non-maintained una located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream bankeach by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dispense)	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widd  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  1. Delineate ripadescriptors. 2. Determine scoelow. 3. Enter the % F	Tree stratum (dbh : with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  .5  each stream bank each by measurin Score for each ries and seach stream bank each by measurin score for each ries and seach stream bank each by measurin score for each ries and seach stream bank each each stream bank each each stream bank each each each each each each each each	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dispense)	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widd  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100		cores*0.01)/2	
Riparian Buffers  Condition Scores  1. Delineate ripalescriptors. 2. Determine scorelow. 3. Enter the % F	Tree stratum (dbh : with > 60% tree cc non-maintained una located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream bankeach by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dispense)	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widd  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	NOTES>>	cores*0.01)/2 1.10	CI
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % f Right Bank	Tree stratum (dbh a with > 60% tree co non-maintained una located within the located with	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream band each by measurin  Score for each ri  100%  1.1	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in	an areas along the ditional Categories and Congth and width. Can the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the second of the second	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5   NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >		CI	
Condition Scores  1. Delineate riptes descriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh a with > 60% tree conon-maintained und located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bani each by measurin  Score for each ri  100%  1.1  100%  1.1  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (an the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prove.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5   NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	1.10	CI	
Condition Scores  1. Delineate ript descriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank 3. INSTREAI undercut banks; Instream	Tree stratum (dbh : with > 60% tree canon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream bank each by measurin 100% 1.1 100% 1.1 aried substrate si iffle poole comple	Con Subo  Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  K into Condition C g or estimating leeparian category in parian category in the parian category in the second containing leeparian category in the second category in th	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (bdh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widd  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- meliated area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.10	CI
Condition Scores  1. Delineate ript descriptors. 22. Determine scoelow. 33. Enter the % f Right Bank  Left Bank  3. INSTREAI	Tree stratum (dbh a with > 60% tree co non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream banicach by measurin Score for each ri 100% 1.1  100% 1.1  aried substrate si iffle poole complesimal	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (an the blocks below the blocks below the blocks below the ptimal ments are typically ments are typically ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & widd  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  Blocks en  High  Deliant of the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.10	CI
Condition Scores  1. Delineate ripadescriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank  3. INSTREAL undercut banks; Instream Habitat/	Tree stratum (dbh a with > 60% tree co non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream banke ach by measurin 100% 1.1 100% 1.1 arried substrate si iffle poole completimal re typically present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below the blocks below the blocks below the conditional ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  price in the covided for you  ginal	ts of length & widd  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.10	CI

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Date Data Point Project # SAR length Impact Factor R1UB 02070011 02-STR-60 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has been guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. SCORE 1.5 1.3 1.1 0.9 0.7 0.5

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

#### INSERT PHOTOS:



Top Left: Typical view of stream with fringe wetland extending north along piers Top Right: Typical view of stream with sandy shoreline, east of railroad bridge Bottom Left: Typical view across stream with railroad bridge piers Bottom Right: Typical view across stream with railroad bridge piers

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date:

02-STR-60

Latitude:

Evaluator:	County: Prince	William	Longitude:	
<b>Total Points:</b> 0 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determine Ephemeral Inte	ination (circle one) ermitter Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes =	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal =)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N <sub>1</sub>	0 = 0	Yes =	= 3
C. Biology (Subtotal =)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed			BL = 1.5 Other = 0	
*perennial streams may also be identified using other methods.		al.		
Notes: NC data for this resource not available (no fi	ield sheets).			
Sketch:				

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams mpact/SAR Cowardin Impact Date SAR# Project # **Project Name** Locality length Factor N/A DC2RVA - Area 02 ۷A 02070011 10/13/2015 1 Name(s) of Evaluator(s) Stream Name and Information L. Eggering 02-STR-61 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) NOTES>> Left **Conditional Category** bank contains railroad Optimal Suboptimal Marginal ballast & ROW, therefore Low Marginal: Non-maintained, ligh Poor: Lawns mowed, and nas a low score. Right High Suboptimal: Riparian areas with tree stratum (dbh > ow Suboptima Low Poor: Impervious surfaces, mine spoil lands, High Marginal: Non-maintained, ense herbaceou naintained areas nurseries; no-till Riparian areas wit tree stratum (dbh oank has some UF and egetation, riparia ense herbaceo reas lacking shru and tree stratum cropland; actively grazed pasture, noved utility ROW. North 3 inches) present with >30% tree 3 inches) present, with 30% to 60% Tree stratum (dbh > 3 inches) presen with > 60% tree canopy cover and ar non-maintained understory. Wetland Riparian of Aquia Creek. Field with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory. with >30% tree canopy cover and maintained understory. Rece cutover (dense vegetation). ner a shrub lay hay production, parsely vegetate non-maintained nuded surfac Buffers or a tree layer (db > 3 inches) present, with <30° onds, open water row crops, active feed lots, trails, o Sheet 06-SRT-05. area, recently seeded and tabilized, or oth If present, tree stratum (dbh >3 other comparab conditions. inches) present, with <30% tree tree canopy cover comparable condition. anopy cover wit maintained understory. High Low High Low High Low 1.5 0.85 0.75 0.6 0.5 1.2 1.1 Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below 20% 80% 100% Right Bank 0.5 Score > 1.5 I= (Sum % RA \* Scores\*0.01)/2 60% 40% 0.70 CI 100% Rt Bank CI > % Riparian Area> Left Bank Score > 1.5 0.6 Lt Bank CI > 1.14 0.92 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> IOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number 0.46



Bottom Left: Culvert carrying stream under utility access road Bottom Right: Typical view of stream, upstream from utility access road

NC DWQ Stream Identification Form Version 4.11

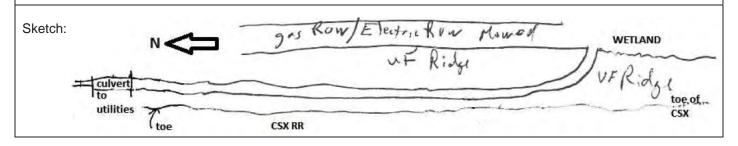
02-STR-61

Date: October 13, 2015	Project/Site: DC2RVA - Area 02	Latitude: 38.43359
Evaluator: L. Eggering	County: Stafford	Longitude: -77.34305
Total Points: 9 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral intermittent Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*			1 3	
	Alicent	14/ I	Ma Janata	04
A. Geomorphology (Subtotal = 5.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0		(2)	3
Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	<b>(</b> 0)	1	2	3
6. Depositional bars or benches		1	2	3
7. Recent alluvial deposits		1	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5	Y	1.5
10. Natural valley		0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual			•	
B. Hydrology (Subtotal = $2.5$				
12. Presence of Baseflow	0	<b>(</b> 1)	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 1			•	_
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	(2)	1	2	3
21. Aquatic Mollusks		1	2	3
22. Fish		0.5	1	1.5
23. Crayfish		0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 16 Other = 0	
	-			

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet 06-STR-05 (N of Aquia Creek).



		Stre	Unit	fied Stream M	lethodology f	or use in Virg		m 1)			
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	02	VA	R2SB	02070011	10/13/2015		iongui	1 40101	
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
	L. Eggering					02-S	ΓR-62				
I. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal	onditional Catego Mar	<sub>ry</sub> ginal	Po	or	Sev	ere	
	1	L MAR	1		Often incised, but	less than Severe or	Overwiden	ed/incised.	1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point barsa are present. Acce floodplain or fully bankfull benches.	or active erosion; 80- inks. Vegetative in or natural rock, 100%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow Il defined. Stream o bankfull benches, d floodplains along	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe were bank slopes. seent on 40-60% of tative protection on Streambanks may creut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks crosion present on ks. Vegetative int on 20-40% of fficient to prevent R 60-80% of the ed by sediment. corary/transient in puting to instability.	Deeply incised vertical/lateral in incision, flow conbanks. Streambe rooting depth, m vertical/underc protection present cbanks, is not pre Obvious bank sle Erosion/raw ban	stability. Severe tained within the do below average ajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%.	
	sediment deposition 10% of	on covers less than	sediment cover	reach. Transient rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar	on is present on > nks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	С
Score	;	3	2	.4	:	2	1.	6	1		2.0
2. RIPARIAI	N BUFFERS: /	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	th may be accep	table)		
2. RIPARIAI	N BUFFERS: /	Assess both bank	Con	an areas along the ditional Cate ptimal	gory	ginal	ts of length & wid		NOTES>>		
2. RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate	gory						
Riparian Buffers	Opti Tree stratum (dbh ; with > 60% tree cr. non-maintained un	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed jobs, active feed of other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream bant each by measurin score for each ries.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5 he sums iparian qual 100			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bank each by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
Riparian Buffers  Condition Scores  Delineate rip descriptors. Delineate rip descriptors. Enter the %	Tree stratum (dbh: with > 60% tree cr non-maintained un located within th  1. arian areas along quare footage for e	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream bant each by measurin score for each ries.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5 he sums iparian qual 100		cores*0.01)/2	
Condition Scores  Delineate rip descriptors. Delow. Enter the % Right Bank	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bank each by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5 he sums iparian qual 100	NOTES>>	cores*0.01)/2 1.50	CI
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %  Right Bank	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream band each by measurin  Score for each ri  100%  1.5	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * S		
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree cc non-maintained un- located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  M Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin  Score for each ri  100%  1.5  100%  1.5  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	1.50	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the %  Right Bank  Left Bank  3. INSTREAl undercut banks;	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin  Score for each ri  100%  1.5  100%  1.5  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provinced to the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.50	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin  Score for each ri  100%  1.5  100%  1.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicate the control of the cont	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hap production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.50	
Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree conon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bank each by measurin  Score for each ri  100%  1.5  100%  1.5  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo  Stable habitat elpresent in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically % of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en  Attention of the comparable condition of the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.50	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi; root mats; SAV; r  Opti Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bank each by measurin  Score for each ri  100%  1.5  100%  1.5  aried substrate si iffle poole completimal  are typically present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le  parian category in  zes, water velocit exes, stable featur  Subo Stable habitat ele present in 30-509 are adequate fo popul	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below ty and depths; wo res.  Conditional ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to f % R Blocks end	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  he sums iparian qual 100  100%  100%  Iness; shade;	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.50	CI 1.5(

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor N/A CSX R2SB 02070011 10/13/2015 02-STR-62 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Rip-rap lined channel below culvert Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed i srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. SCORE 1.5 0.5 1.3 1.1 0.9 0.7 0.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

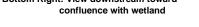
CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View upstream toward culvert under railroad

Bottom Right: View downstream toward confluence with wetland



NC DWQ Stream Identification Form Version 4.11

02-STR-62

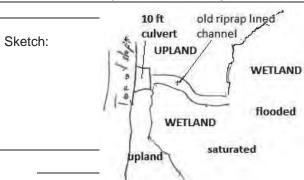
Date: October 13, 2015	Project/Site: DC2RVA - Area 02	Latitude: 38.432920
Evaluator: L. Eggering	County: Stafford	Longitude: -77.343792
<b>Total Points:</b> 40.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle enc) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

if $\geq 19$ or perennial if $\geq 30^*$	Ephemeral Inte	rmittent Perenn	e.g. Quad Name:	1
A. Geomorphology (Subtotal = 16)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	1	2	(3)
6. Depositional bars or benches	<b>Q</b>	1	2	3
7. Recent alluvial deposits	( <u>0</u> )	1	2	3
8. Headcuts	8	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $10.5$ )				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	(3)
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
C. Biology (Subtotal = 14 )				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
				1

C. Biology (Subtotal = 14				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75	OBL = 1.5 Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: North of Aquia Creek, tributary to Boar Creak. Field Sheet 06-SRT-04.



#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 02 02070011 10/13/2015 Stream Name and Information Name(s) of Evaluator(s) 02-STR-63 K. Astroth 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Field Sheet 06-STR-03 Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: Lawns, mowed (north of Aquia Creek). ligh Suboptima High Marginal: Riparian areas ense herbaceou and maintained Riparian areas Low Poor: with tree stratum (dbh > 3 inches) present, with vegetation, riparian areas acking shrub and Non-maintained with tree stratum (dbh > 3 inches) reas, nurseries ense herhaceou no-till cropland vegetation with either a shrub Free stratum (dbh > 3 inches) preser spoil lands, resent, with 30% to 60% tree actively grazed Riparian 30% tree canon tree stratum, hav pasture, sparsely vegetated non-maintained area, with > 60% tree canopy cover and ar enuded surface cover and a maintained roduction, ponds open water. If laver or a tree canopy cover an containing both row crops, active eed lots, trails, or **Buffers** on-maintained understory. Wetland layer (dbh > 3 inches) present, understory present, tree herbaceous and recently seeded ther comparable Recent cutove with <30% tree stratum (dbh >3 shrub layers or a non-maintained and stabilized, o conditions. (dense vegetation). canopy cover. inches) present with <30% tree understory canopy cover with maintained High Low High High Low Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 0% Right Bank Score > CI= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> 0% Rt Bank CI > 0.00 CI Left Bank 0.00 Lt Bank CI > 0.00 Score > REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number THE REACH CONDITION INDEX (RCI) >> 0.00 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: View upstream toward culvert under railroad Top Right: View downstream toward confluence with wetland

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

**Date:** October 13, 2015

02-STR-63

Latitude: 38.431627

T ( I D ) ( ) 40.5	County: Stafford		Longitude: -77	.0 10221	
Total Points: 18.5 Stream is at least intermittent	Stream Determin	nation (circle one)	Other		
if $\geq 19$ or perennial if $\geq 30^*$	Ephemeral Inter	rmittent Perennial	e.g. Quad Name:		
A. Geomorphology (Subtotal = 7	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	(1)	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	$\Box$	2	3	
5. Active/relict floodplain	0	(1)	2	3	
6. Depositional bars or benches	<u>Q</u>	7	2	3	
7. Recent alluvial deposits		1	2	3	
8. Headcuts	<b>8</b>	1	2	3	
9. Grade control		0.5		1.5	
10. Natural valley	0	0.5	(1)	1.5	
11. Second or greater order channel	No	0 = 0	Yes :	= 3	
<sup>a</sup> artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = 3.5)					
12. Presence of Baseflow	0	1	(2)	3	
13. Iron oxidizing bacteria	0	1	2	3	
13. Iron oxidizing bacteria 14. Leaf litter	0 1.5	1	0.5	3	
-		1 0.5	2		
14. Leaf litter 15. Sediment on plants or debris 16. Organic debris lines or piles	1.5	1 0.5 0.5	2 0.5 1 1	0 1.5 1.5	
14. Leaf litter 15. Sediment on plants or debris	1.5	1 0.5	0.5	0 1.5 1.5	
14. Leaf litter 15. Sediment on plants or debris 16. Organic debris lines or piles	1.5	1 0.5 0.5	2 0.5 1 1	0 1.5 1.5	
14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?  C. Biology (Subtotal = 8 )  18. Fibrous roots in streambed	1.5 0 0 No	1 0.5 0.5	2 0.5 1 1	0 1.5 1.5	
14. Leaf litter 15. Sediment on plants or debris 16. Organic debris lines or piles 17. Soil-based evidence of high water table?  C. Biology (Subtotal = 8)	1.5	1 0.5 0.5	2 0.5 1 1 Yes =	0 1.5 1.5 = 3	
14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?  C. Biology (Subtotal = 8 )  18. Fibrous roots in streambed	1.5 0 0 No	1 0.5 0.5	2 0.5 1 1 Yes =	0 1.5 1.5 = 3 0 0 3	
14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?  C. Biology (Subtotal = 8 )  18. Fibrous roots in streambed  19. Rooted upland plants in streambed	1.5 0 0 No	0.5 0.5 0 = 0	2 0.5 1 1 Yes =	0 1.5 1.5 = 3	
14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?  C. Biology (Subtotal = 8 )  18. Fibrous roots in streambed  19. Rooted upland plants in streambed  20. Macrobenthos (note diversity and abundance)	1.5 0 0 No	1 0.5 0.5 0.5 0 = 0	2 0.5 1 1 Yes =	0 1.5 1.5 = 3 0 0 0 3 3 1.5	
14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?  C. Biology (Subtotal = 8 )  18. Fibrous roots in streambed  19. Rooted upland plants in streambed  20. Macrobenthos (note diversity and abundance)  21. Aquatic Mollusks	1.5 0 0 No	1 0.5 0.5 0 = 0 2 2 1 1 0.5 0.5	2 0.5 1 1 Yes =	0 1.5 1.5 = 3 0 0 0 3 3 1.5 1.5	
14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?  C. Biology (Subtotal = 8)  18. Fibrous roots in streambed  19. Rooted upland plants in streambed  20. Macrobenthos (note diversity and abundance)  21. Aquatic Mollusks  22. Fish	3 3 3 0	1 0.5 0.5 0.5 0 = 0	2 0.5 1 1 Yes =	0 1.5 1.5 = 3 0 0 0 3 3 1.5	
14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?  C. Biology (Subtotal = 8 )  18. Fibrous roots in streambed  19. Rooted upland plants in streambed  20. Macrobenthos (note diversity and abundance)  21. Aquatic Mollusks  22. Fish  23. Crayfish	3 3 3 0 0	1 0.5 0.5 0 = 0 2 2 1 1 0.5 0.5	2 0.5 1 1 Yes =	0 1.5 1.5 = 3 0 0 0 3 3 1.5 1.5 1.5	

Sketch: Flow -> Darest Land Wetland Wetland Library Library

wetland, iron oxidizing bacteria at flow to wetland (Pics: 274-276). Field Sheet 06-STR-03 (north).

DC2RVA - Area 02 VA R6 02070011 10/13/2015 10/13/2015 11/13/2015 1	DC2RVA - Area 02 VA R6 02070011 10/13/2015 10/13/2015 11/2015				Onn	ied Stream M			Jiiia			
Stream Name and Information  W. Astroth  Conditional Category  Optimal  Suboptimal  Najk Suboptimal  Nov Marginal  Nover and Nov Marginal  Nov Marginal  Nov Marginal  Nov Marginal  N	Association (a) Stream Name and Information  (Association (a) Stream Name and Information (a) Name (a) Stream Name (a) Na	oject#	Project Name				Cowardin		Date	SAR#		•
Conditional Category	RIAN BUFFERS: Assess both bank's 100 foot rigamen areas along the enter SAR. (rough measurements of length & width may be acceptable)    Conditional Category   Marginal   Poor   Track to e of slope along original with the everal marginal with the	N/A					02070011	10/13/2015			1	
Conditional Category  Optimal  Optimal  Figh Suboptimal  Figh area areas with tree strain (db - 3 inches) present, with present, with software comprover and containing of influence of influence of the comprover and containing of influence of influence of the containing of the containing of restinating density of the containing of the	Conditional Category  Optimal Suboptimal Webstern Suboptimal Webst			tor(s)	Stream Nam	e and Informa	ation	02.61	TD 64			
Conditional Category   Suboptimal   Subopt	Conditional Category    Continual   Contin		K. ASTIOTH					02-3	K-04			
Optimal Suboptimal	Optimal Suboptimal Low Suboptimal Righ Suboptimal Righ Suboptimal Righ Suboptimal Righ Suboptimal Rights Suboptimal Righ	RIAN	BUFFERS: A	Assess both bank	's 100 foot riparia	n areas along the	entire SAR. (rou	gh measurements	of length & width	may be acceptab	ole)	
High Suboptimal: Riparian areas with tree stratum (sh > 3 inches) present, with 20% tree canopy cover and an on-maintained, understory.  High Low High High Poor: Low Poor: Inversional character, with reas a transitioned, dense herbaceous harderstrature (abrace) High Poor: Low Poor: Inversional character High Marginal High Poor: Low Poor: Inversional Character High Marginal Holl High Marginal High Marginal High Marginal High Marginal High Marginal High Poor: Low Poor: Low Poor: Inversional Character High Section High High Poor: Low Poor:	High Suboptimals (Royarra rate of Payran and Suboptimals (Royarra rate) (Royarra		Onti	imal				ninal	De			slone along
1.5 1.2 1.1 0.85 0.75 0.6 0.5  Injurian areas along each stream bank into Condition Categories and Condition Scores using the descriptors, esquare footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian  % Riparian Area and Score for each riparian category in the blocks below.    Riparian Area   95%   5%   100%   100%	1.5 1.2 1.1 0.85 0.75 0.6 0.5  Tripartian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  The square footage for each by measuring or estimating length and width. Calculators are provided for you give and Score for each riparian category in the blocks below.  The square footage for each sparian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footage for each parian category in the blocks below.  The square footag		Tree stratum (dbh > with > 60% tree car	<ul> <li>3 inches) present, nopy cover and an derstory. Wetlands</li> </ul>	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dhb > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	edge of ripar right bank. S maintained R power lines a of riparian ar bank. Field S 02 (north of A	ian zone on omewhat OW for along edge ea on left heet 06-STF
riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. e square footage for each by measuring or estimating length and width. Calculators are provided for you  % Riparian Area and Score for each riparian category in the blocks below.	e square rockege for each symmetry of each stream bank into Condition Categories and Condition Scores using the descriptors.  e square foolage for each symmetry of each symmetry of the blocks below.    Secretary   1.2   0.6	ion	4	<u>-</u>	_			I		I.		
square footage for each by measuring or estimating length and width. Calculators are provided for you  // Riparian Area and Score for each riparian category in the blocks below.    Maintain Area   Maintain	square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Blocks equal 100  k Riparian Areas and Score for each riparian category in the blocks below.    Blocks equal 100   Blocks equ		1.	.u	1.2	1.1	0.83	0.75	0.0	0.5		
Note	% Riparlan Area> 95% 5%   1.0   Lt Bank Cl> 1.17	e % Ri	iparian Area and S % Riparian Area>	Score for each rip	parian category in	-				qual 100		
Score > 1.2 0.6 Lt Bank CI > 1.17  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  PHOTOS:		% Riparian Area	95%	5%					1000/		
and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	s and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  PHOTOS:	nk	·		U / U					100%		1.17
THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  RCI = Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  HOTOS:			1.2	0.6					100%	-	
COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  PHOTOS:					NDEX and S	TREAM COI	NDITION UN	ITS FOR TH		-	
CR = RCI X LF X IF	HOTOS:	and R		REACH C	ONDITION I			NDITION UN	ITS FOR TH	IS REACH	Lt Bank CI >	1.17
	HOTOS:	nd R		REACH C	ONDITION I			NDITION UN		IS REACH THE REACH O	Lt Bank CI >	1.17 PEX (RCI) >>
	BE PROPOSED IMPACT:		Cl should be rounded	REACH C	ONDITION I			NDITION UN		IS REACH THE REACH C	CONDITION IND CI= (Riparian CI ON REQUIREM	1.17 PEX (RCI) >>

NC DWQ Stream Identification Form Version 4.11

02-STR-64

Date: October 13, 2015	Project/Site: D0	C2RVA - Area 02	Latitude: 38.42	29470	
Evaluator: K. Astroth	County: Staffor	<sup>-</sup> d	Longitude: -77.347488		
<b>Total Points:</b> 12.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal = 6)	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3	
2. Sinuosity of channel along thalweg	0	1	(2)	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
Particle size of stream substrate	0	1)	2	3	
5. Active/relict floodplain	6	1	2	3	
6. Depositional bars or benches		1	2	3	
7. Recent alluvial deposits		1	2	3	
8. Headcuts		1	2	3	
9. Grade control		0.5	1	1.5	
10. Natural valley		0.5		1.5	
11. Second or greater order channel	- N	0.5	Yes:		
artificial ditches are not rated; see discussions in manual		0 - 0	163 -	- 3	
B. Hydrology (Subtotal = $\frac{1}{2}$ )	_				
12. Presence of Baseflow	(0)	1	2	3	
13. Iron oxidizing bacteria		1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	(N	0 = 0	Yes =	= 3	
C. Biology (Subtotal = 5.5	_				
18. Fibrous roots in streambed	(3)	2	1	0	
19. Rooted upland plants in streambed	3	(2)	1	0	
20. Macrobenthos (note diversity and abundance)	<b>(</b> )	Y	2	3	
21. Aquatic Mollusks	<del>                                      </del>	1	2	3	
22. Fish	8	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians		0.5	1	1.5	
25. Algae		0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OB	L = 16 Other = 0		
*perennial streams may also be identified using other met	hods. See p. 35 of manua				
Notes: Channel present, no flow/water, some si			Pics: 268-270). F	ield Sheet	
06-STR-02 (north of Aquia Creek).	,,	(***********			
Sketch: N \$100 ->	06-STR-02	€€(114) ← 06-STR-01 − culvert			
tracks					

Project # Project Name   Locality   Class   Muc   Date   SAR #   Impact/SAR   Factor   N/A   DCRVA - Area 02   VA   R6   02070011   10/13/2015   1   1   1   1   1   1   1   1   1	Project # Project Name   Locality   Class.   HuC   Date   SAR #   Impact   Impact   Ingration   Ingrat		Ephe	mera	I Stre	fied Stream N	lethodology f	or use in Virg		(Fori	m 1a)		
N/A DC2RVA - Area 02 VA R6 02070011 10/13/2015 1 1  Name(s) of Evaluator(s) Stream Name and Information  K. Astroth  Conditional Category  Conditional Cat	N/A DC2RVA - Area 02 VA R6 02070011 10/13/2015 1 10/13/20	Project #		Project Name	•		Cowardin		Date	SAR#			
Name(s) of Evaluator(s)  K. Astroth  O2-STR-65  2. RIPARIAN BUFFERS: Assess both banks 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal High Suboptimal Private Assess both banks 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  NOTES>  Tracks along left bank. Maintained ROW on right hanks. Field Sheet of the stream bank into Condition Solver and a serial areas.  Note and a private areas along each stream bank into Condition Categories and Condition Solvers using the descriptors.  2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you believe.  Left Bank  No. Riparian Areas Solve for each riparian category in the blocks below.  Solve S	Name(s) of Evaluator(s)  K. Astroth  Ogeninal Subpolimal Magina Ma	•	Project Name Locality Class. HUC Date SAR #							SAK#		Factor	
Riparian Buffers  Conditional Category  Optimal Suboptimal  High Suboptimal Riparian areas High Marginal Low Poor High Low Poor High Low  Riparian Areas and Score for each riparian category at the blocks below.  Ripht Bank Score > 1.2 0.66  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >> RCI (Riparian CI))  Compensation Recurrence of the Reach Complexion of the Reach Compensation of the Reach Compensa	Conditional Category  Optimal Suboptimal Integration areas along the entire SAR. (rough measurements of length & width may be acceptable)  Righ Suboptimal Integration and the cardinal propers are season and the cardinal propers are season at the season and the season and the season and the season and the season at the season and							02070011	10/13/2015			1	
2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal High Suboptimal Riparian areas with research that the set stratum (6th > 3 inches) persent, with 20% tree carely cover and a reast. with 20% tree carely cover and a reast with 20% tree carely cover and an areast with 20% tree carely cover and a reast with 20% tree carely cover with 20% tree carely co	Conditional Category  Optimal Suboptimal (Feb Business and Programs Annual Suboptimal Programs Annual Programs Annu	ivaine		.or(a)	Su cam Nam	e and miorific	ation	02-51	TR-65				
Conditional Category	Optimal Suboptimal (and Category Suboptimal Warginal Wile Suboptimal Wile Suboptimal Regular reas wife the station of the station of the Suboptimal Regular reas wife the station of the station of the Suboptimal Regular reas wife the station of the stat												
Condition   Scores   1.5   1.2   1.1   0.85   0.75   0.6   0.5	Condition   Scores   1.5   1.2   1.1   0.85   0.75   0.6   0.00%	2. RIPARIAN	N BUFFERS: A	ssess both bank				gh measurements	of length & width	may be acceptal			
Riparian Buffers  The stratum (dbh > 3 inches) present, with 160% tree canopy cover and non-maintained understory. Wetlands areas.  The stratum (dbh > 3 inches) present, with 160% tree stratum, dbh > 3 inches) present, with 160% tree stratum, dbh > 3 inches) present, with 160% tree stratum, dbh > 3 inches) present, with 160% tree stratum, dbh > 3 inches) present, with 160% tree canopy cover and non-maintained understory. Wetlands areas.  The stratum (dbh > 3 inches) present, with 160% tree canopy cover and non-maintained understory. Wetlands areas.  The stratum (dbh > 3 inches) present, with 160% tree canopy cover and non-maintained understory. Wetlands areas.  The stratum (dbh > 3 inches) present, with 160% tree canopy cover and non-maintained understory. Wetlands areas.  The stratum (dbh > 3 inches) present, with 160% tree canopy cover and non-maintained understory. Wetlands areas.  The stratum (dbh > 3 inches) present, with 20% tree canopy cover and non-maintained understory.  The stratum (dbh > 3 inches) present, with 20% tree canopy cover and stratum, dbh > 3 inches) present, with 20% tree canopy cover and stratum (dbh > 3 inches) present, with 20% tree canopy cover with 30% tree canopy cover with 30 inches) pre	Right Bank Scores 1.2 0.6 1.5 1.5 1.2 0.6 1.6 1.5 1.5 1.0 1.6 1.5 1.5 1.0 1.6 1.5 1.5 1.0 1.6 1.5 1.5 1.6 1.6 1.6 1.6 1.5 1.6 1.7 1.6 1.6 1.6 1.7 1.6 1.6 1.7 1.6 1.6 1.7 1.6 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7		Opti	mal			<del>, , , , , , , , , , , , , , , , , , , </del>	ginal	Po	oor		left bank.	
Condition Scores	Condition   1.5   1.2   1.1   0.85   0.75   0.6   0.5	•	Tree stratum (dbh > with > 60% tree car	3 inches) present, nopy cover and an erstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	right bank. F 06-STR-01 (r Aquia Creek	ield Sheet orth of	
Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below. 3. Enter the % Riparian Area and Score for each riparian category in the blocks below.    Right Bank   % Riparian Area   95%   5%   100%	Scores 1.5 1.2 1.1 U.88 U.75 U.6 U.5  1. Delineate (parkan areas along each stream bank into Condition Categories and Condition Scores using the descriptors are growted for you below.  2. Determine square bodtage for each by measuring or estimating length and width. Calculators are provided for you below.  3. Enter the % Ripartian Areas 95% 5% 12 0.6 100%  Score > 1.2 0.6 100%  REght Bank Score > 1.2 0.6 100%  REBANK CONDITION UNITS FOR THIS REACH  CONDITION UNITS FOR THIS REACH CONDITION UNITS FOR THIS REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH CONDITION INDEX (RCI) >> RCI e (Ripartian CI)/2 COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF	Condition					_	ı			1		
2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  3. Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank	2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you believ.  Right Bank Right and Area and Score for each riparian category in the blocks below.  Blocks equal 100  Circ (Sum % RA * Scores*0.01)/2  Left Bank Right and Area 50% 50% 50% 1.2 0.6 100% Rt Bank Cl > 1.17  Left Bank Score > 1.2 0.6 100% Rt Bank Cl > 0.90  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  WOZE: The Cis and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCl) >> CR = RCl X LF X IF  INSERT PHOTOS:		1.5	5	1.2	1.1	0.85	0.75	0.6	0.5			
Right Bank	Right Bank	2. Determine sq											
Score >   1.2   0.6	Score   1.2   0.6	3. Enter the % R	1			the blocks below.			Blocks e				
Cl= (Sum % RA * Scores*0.01)/2   Left Bank	Left Bank % Riparian Areas 50% 50% 1.2 0.6 100% Rt Bank Cl > 1.17  Score > 1.2 0.6 The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCl) >> RCl= (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >> CR = RCl X LF X IF  INSERT PHOTOS:	Right Bank	· ·							100%			
Score > 1.2 0.6 Lt Bank CI > 0.90  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  WOTE: The Cis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  INSERT PHOTOS:		300.07										
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCl) >>  RCl= (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCl X LF X IF  INSERT PHOTOS:	Left Bank	· ·							100%			
RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF					NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH		0.00	
COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  INSERT PHOTOS:	NOTE: The Cls and F	RCI should be rounded	to 2 decimal places	. The CR should be ro	ounded to a whole nun	nber.					, ,	
CR = RCI X LF X IF	INSERT PHOTOS:  CR = RCI X LF X IF												
NSERT PHOTOS:												Litti (OR)	
	DESCRIBE PROPOSED IMPACT:	INSERT PHO	OTOS:										

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

**Date:** October 13, 2015

02-STR-65

Latitude: 38.428660

Evaluator: K. Astroth	County: Staffor	d	Longitude: -77	7.348461
<b>Total Points:</b> 13.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) ermittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 6)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
Sinuosity of channel along thalweg	0	1	<u> </u>	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches		1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	(0)	1	2	3
9. Grade control		0.5	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No	0 = 0	Yes :	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 1				
12. Presence of Baseflow	(6)	1	2	3
13. Iron oxidizing bacteria		1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes :	= 3
C. Biology (Subtotal = $\underline{6.5}$ )				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	TO TO	1	2	3
21. Aquatic Mollusks	(9)	1	2	3
22. Fish	8	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians		0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 16 Other = 0	
*perennial streams may also be identified using other method	ods. See p. 35 of manua	al.		
Notes: No flow, a few small pools at low areas (a	at base of root wad:	s) (Pics: 271, 272, 2	.73)	
Field Sheet 06-STR-01 (north of Aquia C	reek)			
Sketch:	C DOM	not as channe	more channelized	d
Tracks			-	

		Stre	Unit	fied Stream N	ment lethodology f	or use in Virg	ginia	m 1)			
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or HUC	Date Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Area 02 V/		VA	R1	02070011	N/A		lengin	1 actor		
Name	(s) of Evaluator(s) Stream Name and		e and Informa	ation							
					02-	STR-66	(Aquia C	reek)			
1. Channel Co	ondition: Asse	ess the cross-sec	tion of the stream		ondition (erosion,						
	Opti	imal	Subo	ptimal	onditional Catego Mar	g <mark>inal</mark>	Po	or	Sev	vere .	
	1	AND SHE	19			less than Severe or			1	5	
Condition	Very little incision on 100% stable bain surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. sediment depositio sediment depositio	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ess to their original of developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	ew areas of active ted banks. Majority table (60-80%). tion or natural rock 80%) AND/OR ures contribute to ikfull and low flow Il defined. Stream o bankfull benches, d floodplains along each. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositiv stability, may be	stable than Severe wer bank slopes. esent on 40-60% of lative protection on Streambanks may creat. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is inst. erosion. AND/OI stream is cover Sediment is temp nature, and contril AND/OR V-shapi	ority of both banks Frosion present on ks. Vegetative nt on 20-40% of officient to prevent R 60-80% of the ad by sediment. overay/transient in outing to instability. ed channels have	roting depth, r vertical/underc protection present of banks, is not pre Obvious bank sla Erosion/raw ban	stability. Severe ntained within the ad below average najority of banks tut. Vegetative on less than 20% of eventing erosion. bughing present.	
	sediment deposition 10% of 1			s 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protecti 40% of the bar sediment depor	nks and stable	than 80% of stream deposition, contrib Multiple thread subterran	bed is covered by outing to instability. channels and/or	С
Score	3	3	2	.4		2	1.	.6	1	l	3.0
2. RIPARIAN	BUFFERS: A		Con	n areas along the ditional Category ptimal		ugh measuremen	ts of length & wid		NOTES>>		
Riparian Buffers r	with > 60% tree ca	derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Candition			High	Low	High	Low	High	Low			
Condition Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
descriptors.	uare footage for e	each by measurin Score for each ri	g or estimating le	ngth and width. (	ondition Scores us Calculators are prove		Ensure t of % R Blocks e	liparian qual 100			
Right Bank	% Riparian Area>	90% 1.2	10% 0.5					100%			
									Cl= (Sum % RA * S		
Left Bank	% Riparian Area>	80% 0.5	20% 0.85					100%	Rt Bank CI >	1.13 0.57	0.8
3. INSTREAM undercut banks; ro	I HABITAT: Va	aried substrate si	zes, water velocit		ody and leafy deb	oris; stable substr	ate; low embeded	Iness; shade;	NOTES>>	0.01	0.0
				Conditiona							
Instream		mal	Subo	ptimal	Mar	ginal	Po	or	Ī		
Habitat/	Opti		Stable habitat ele	ments are typically	Stable habitat ele		Habitat elements				
Habitat/	•	re typically present	Stable habitat element of stable habitat element in 30-50% are adequate for	ments are typically 6 of the reach and r maintenance of ations.	present in 10-30% are adequate fo	ments are typically 6 of the reach and r maintenance of ations.	lacking or are ur	nstable. Habitat ally present in less			CI

Stream Impact Assessment Form Page 2										
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R1	02070011	N/A	02-STR-66			
	CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, bankments, spoil piles, constrictions, livestock  Conditional Category									
	Negligible	Mir	nor	Mod	erate	Se	vere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than to disrupted by an alterations listed guidelines AND/to shored with ga	30% of reach is yy of the channel in the parameter DR 80% of banks abion, riprap, or nent.			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: View of railroad bridge over Aquia Creek Bottom Right: Typical view of waterbody 0

**Aquia Creek** 

02-STR-66

NC DWO Stream Identification Form Version 4.11 Date: Project/Site: DC2RVA - Area 02 Latitude: 38.422967 **Evaluator:** County: Stafford Longitude: -77.355317 Total Points: 22.5 Stream Determination (circle one) Other Stream is at least intermittent e.g. Quad Name: Ephemeral Intermittent Perennial if ≥ 19 or perennial if ≥ 30\* **Absent** Weak Moderate Strong A. Geomorphology (Subtotal = 10.51<sup>a.</sup> Continuity of channel bed and bank 0 (3) 2 2. Sinuosity of channel along thalweg 0 1 2 3. In-channel structure: ex. riffle-pool, step-pool, 0 2 3 1 ripple-pool sequence 4. Particle size of stream substrate 0 2 3 1 5. Active/relict floodplain 0 2 (3) 1 6. Depositional bars or benches 0 1 2 3 7. Recent alluvial deposits 0 1 2 3 8. Headcuts 2 3 0 1 9. Grade control 0 0.5 1 10. Natural valley 0 0.5 1.5 11. Second or greater order channel No = 0Yes = 3artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 4.512. Presence of Baseflow 2 0 1 3 13. Iron oxidizing bacteria 0 2 3 1 14. Leaf litter 1.5 1 0.5 0 15. Sediment on plants or debris 0.5 1 1.5 16. Organic debris lines or piles 0 0.5 1 1.5 17. Soil-based evidence of high water table? No = 0Yes = 3C. Biology (Subtotal = 7.518. Fibrous roots in streambed 2 0 19. Rooted upland plants in streambed 3 2 1 0 20. Macrobenthos (note diversity and abundance) 2 3 1 0 3 21. Aquatic Mollusks 1 2 22. Fish 0.5 1.5 1 23. Crayfish 0 0.5 1 24. Amphibians 0 1.5 0.5 1 25. Algae 0 0.5 1.5 26. Wetland plants in streambed FACW = 0.75; OBL = 1.5 Other = 0 \*perennial streams may also be identified using other methods. See p. 35 of manual. Notes: Field Sheet missing, information filled out using available online data. Sketch:

		Stre	Uni	fied Stream M	lethodology f	or use in Virg		m 1)			
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	02	VA	R4SB3	02070011	10/12/2015		lengin	Factor	
	e(s) of Evalua			e and Informa							
	K. Astroth					02-S	ΓR-67				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal	onditional Catego Mar	ry ginal	Po	or	Sev	ere	
		WAR OF THE PERSON OF THE PERSO	1			less than Severe or	Overwiden		1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or full) bankfull benches. and transverse ba	on or natural rock, 100%). AND/OR /bankfull benches less to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are stogetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to rewly develope	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, dfloodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe ewer bank slopes. sesent on 40-60% of tative protection on Streambanks may creat. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.		stability. Severe tained within the do below average tajority of banks ut. Vegetative on less than 20% of venting erosion. Doughing present. ks on 80-100%.	
	sediment deposition 10% of	on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protecti 40% of the bar sediment depos	ks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by outing to instability. channels and/or	c
Score	3	3	2	.4		2	1.	6	1		2.
DIDADIA	N DUEEEDO:										
2. RIPARIAI	N BUFFERS: /	Assess both bank	Con	an areas along the	gory	ugh measuremen	ts of length & wide		ntable)		
2. RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate	gory						
Riparian Buffers	Opti	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti Tree stratum (dbh: with > 60% tree canon-maintained unlocated within th	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Opti Tree stratum (dbh: with > 60% tree canon-maintained unlocated within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processed.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strain areas along quare footage for experience and strain area and	imal  > 3 inches) present, anopy cover and a destory. Wetlands e riparian areas.  .5  each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processed.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
Riparian Buffers  Condition Scores  Delineate rip descriptors. Delineate rip scoelow. Enter the %	Tree stratum (dbh: with > 60% tree conon-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processed.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5		cores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate rip elescriptors. Delineate rip scores  Enter the %	Tree stratum (dbh: with > 60% tree canon-maintained unit located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 75% 1.2  100%	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processed.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	1.05	С
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree canon-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  M Riparian Area> Score >	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 75% 1.2  100% 1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.6	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (In the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel olds, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>		<u>C</u>
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the % Right Bank  Left Bank  1. INSTREAL undercut banks;	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 75% 1.2  100% 1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.6	ditional Cate ptimal Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (In the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Academic Scores us Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel olds, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.05	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 75% 1.2  100% 1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.6	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided by the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with +30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.05	
Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5  each stream ban each by measurin 75% 1.2  100% 1.2  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.6	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (In the blocks below ty and depths; wo res.  Conditiona ptimal ments are typically % of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Acalculators are proved and leafy detection of the condition of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically 6 of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks end  Habitat elements lacking or are ur	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 0.5  Low 100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >  NOTES>>	1.05	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree conon-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi. root mats; SAV; r  Opti Habitat elements a in greater than 5	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5  each stream ban each by measurin 75% 1.2  100% 1.2  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.6	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below the product of the blocks below the product o	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to discovery and the seeded and stabilized and stabil	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  100%  100%  100%  101%  1	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >  NOTES>>	1.05	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor R4SB3 02070011 10/12/2015 02-STR-67 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. SCORE 1.5 0.5 1.3 1.1 0.9 0.7 1.30

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



NC DWO Stream Identification Form Version 4.11

02-STR-67

Date: 10/12/2015	Project/Site: DC2RVA - Area 02	<b>Latitude:</b> 38.419340
Evaluator: K. Astroth	County: Stafford	Longitude: -77.358666
<b>Total Points:</b> 26 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

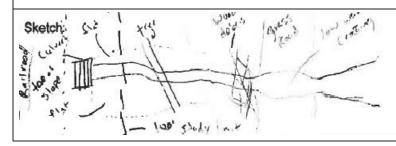
A. Geomorphology (Subtotal = 8	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	ð	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	0	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	<b>(</b> N	lo = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $8.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	(3)
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
·				<u> </u>

12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	(3)
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	lo = 0	Yes	= 3
C Biology (Subtotal = 9.5				

C. Biology (Subtotal = <u>9.5</u> )				_
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	(I)	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	(ō)	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Downstream of railroad culvert, adjacent to 06-WTL-01, crayfish burrows present, amphibians present in pools



		Stre			ment lethodology f		(For	m 1)			
					nels classified a		perennial		Impact/SAR	Impact	
Project #		Project Name	)	Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A		2RVA - Area		VA	R2SB	02070011	10/12/2015				
Nam	e(s) of Evalua K. Astroth	tor(s)	Stream Nam	e and Informa	ation	02.67	ΓR-68				
. Channel C	Condition: Asse	ess the cross-sec	tion of the stream	and prevailing c	ondition (erosion		K-00				
. 0.1.0.1.1.0.1	Opti				onditional Categor		Po	or	Sev	vere	
	1	NAME OF THE PROPERTY OF THE PR	1		1	less than Severe or	Overwidene	5	1	5	
Channel Condition	100% stable bal surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	n or natural rock, 00%). AND/OR /bankfull benches ess to their original	erosion or unproted of banks are st Vegetative protect prominent (60-Depositional feat stability. The bar channels are wellikely has access to or newly develope portions of the r	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream to bankfull benches, of floodplains along reach. Transient	Poor. Banks more or Poor due to lo Erosion may be pri both banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sec temporaryltranistability. Depositic stability, may be	stable than Severe wer bank slopes. seent on 40-60% of lative protection on Streambanks may rorut. AND/OR 40- h is covered by diment may be sient, contribute on that contribute to forming/present.	Vertically/laterally widen further. Majare near vertical. E 60-80% of banl protection prese banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib. AND/OR V-shape	unstable. Likely to ority of both banks rosion present on ks. Vegetative nt on 20-40% of fficient to prevent & 60-80% of the ed by sediment. orary/transient in unting to instability. d channels have	banks. Streamber rooting depth, my vertical/undercroprotection present of banks, is not pre Obvious bank sla Erosion/raw ban AND/OR Aggradin	stability. Severe tained within the ad below average najority of banks tut. Vegetative on less than 20% of eventing erosion. oughing present. tks on 80-100%. g channel. Greater	
	10% of			rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protection 40% of the band sediment depose	iks and stable	than 80% of stream deposition, contrib Multiple thread subterran	outing to instability. channels and/or	CI
Score	3	3	2	.4	2	2	1.	6	1	I	2.0
RIPARIA	N BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (roi	ugh measuremen	ts of length & widt	h mav be accen	table)		
2. RIPARIAI	Opti		Con	ditional Categorial Categorial	gory	ginal Low Marginal:	ts of length & widt	or	NOTES>> A	ow water	
Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Ро	Low Poor:	NOTES>> A	ow water or oad. low to me pools,	
Riparian Buffers	Opti Tree stratum (dbh - with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a href="https://doi.org/10.10/">https://doi.org/10.10/</a>	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> A there is a le crossing fo dirt/grass i Moderate f stream, so small riffle	ow water or oad. low to me pools,	
Riparian	Tree stratum (dbh : with > 60% tree cc non-maintained una located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> A there is a le crossing fo dirt/grass i Moderate f stream, so small riffle	ow water or oad. low to me pools,	
Riparian Buffers  Condition Scores  Delineate rip: escriptors. Determine scelow.	Tree stratum (dbh : with > 60% tree conon-maintained un located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums ipparian qual 100	NOTES>> A there is a le crossing fo dirt/grass i Moderate f stream, so small riffle	ow water or oad. low to me pools,	
Condition Scores  Delineate rip: Secriptors. Determine scelow. Enter the % I	Tree stratum (dbh : with > 60% tree or non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> A there is a le crossing fo dirt/grass i Moderate f stream, so small riffle	ow water or oad. low to me pools,	
Riparian Buffers  Condition Scores  Delineate rips Secriptors. Determine Scolow. Enter the % I	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream baneach by measurin Score for each ri 100% 1.1	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	NOTES>> A there is a la crossing for dirt/grass in Moderate f stream, so small rifflet glides.	ow water or oad. low to me pools, s and	
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Riparian Buffers  Condition Scores  Delineate ripsecriptors. Determine solow. Enter the % I	Tree stratum (dbh : with > 60% tree co non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.1  100% 1.1  arried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (congth and width.) In the blocks below  ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/es/">https://doi.org/10.100/j.nc/es/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies the seeded and stabilized area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> A there is a la crossing for dirt/grass in Moderate f stream, so small rifflet glides.	ow water or oad. low to me pools, s and	CI 1.10
Riparian Buffers  Condition Scores  Delineate riprescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAI	Tree stratum (dbh a with > 60% tree co conon-maintained una located within the located wi	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.1  100% 1.1  arried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (congth and width.) In the blocks below  ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provinced to the condition of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies the seeded and stabilized area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> A there is a le crossing fo dirt/grass i Moderate f stream, so small riffle glides.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	ow water or road. low to me pools, s and	
Condition Scores  Delineate ripsescriptors. Determine scolow. Enter the % I	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.1  100% 1.1  arried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the control of the con	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, traits conditions.  Low 0.5  Low 0.5  100%  100%	NOTES>> A there is a le crossing fo dirt/grass i Moderate f stream, so small riffle glides.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	ow water or road. low to me pools, s and	
Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/ Available	Tree stratum (dbh : with > 60% tree canon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin 100% 1.1 100% 1.1 arried substrate si iffle poole completimal re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo  Stable habitat elpresent in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate layer Stable habitate lerpresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically 6 of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ed  All Control of the control of t	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> A there is a le crossing fo dirt/grass i Moderate f stream, so small riffle glides.  Cl= (Sum % RA * S Rt Bank Cl> Lt Bank Cl> NOTES>>	ow water or road. low to me pools, s and	1.10
Riparian Buffers  Condition Scores  Delineate rip: escriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th  1. arian areas along the strategy of the stratum (dbh : strategy of the strategy	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each ri  100%  1.1  100%  1.1  aried substrate si iffle poole completimal  irre typically present 0% of the reach.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo Stable habitat ele present in 30-509 are adequate fo popul	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below ty and depths; wo res.  Conditional ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks existed and stabilized and stabiliz	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%  100%	NOTES>> A there is a le crossing fo dirt/grass i Moderate f stream, so small riffle glides.  Cl= (Sum % RA * S Rt Bank Cl> Lt Bank Cl> NOTES>>	ow water or road. low to me pools, s and	

Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02070011	10/12/2015	02-STR-68		
	ALTERATION: Stream cross poil piles, constrictions, livestock     Negligible			al Category	straightening of ch	hannel, channeliz		NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		of the channel in the parameter PR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF

#### INSERT PHOTOS:



Typical view of stream, facing downstream away from railroad, toward large wetland south of Aquia Creek

NC DWQ Stream Identification Form Version 4.11

02-STR-68

Date: 10/12/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.417296
Evaluator: K. Astroth	County: Stafford	Longitude: -77.360738
<b>Total Points:</b> 30.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

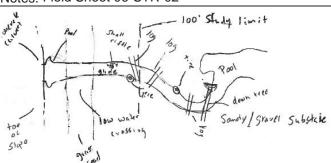
if ≥ 19 or perennial if ≥ 30*	- Prioritoral international policy quad runner							
A. Geomorphology (Subtotal = 10.5	Absent	Weak	Mod <u>e</u> rate	Strong				
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3				
Sinuosity of channel along thalweg	0	1	(2)	3				
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3				
Particle size of stream substrate	0	1	(2)	3				
5. Active/relict floodplain	0	0	2	3				
6. Depositional bars or benches	0	(1)	2	3				
7. Recent alluvial deposits	0	1	2	3				
8. Headcuts	0	1	2	3				
9. Grade control	0	0.5	1	1.5				
10. Natural valley	0	(0.5)	1	1.5				
11. Second or greater order channel	( No	0 = 0	Yes:	= 3				
a artificial ditches are not rated; see discussions in manual								
B. Hydrology(Subtotal = <u>8</u> )			_					
12. Presence of Baseflow	0	1	2	3				
13. Iron oxidizing bacteria	0	(1)	2	3				
14. Leaf litter	1.5	<b>(7)</b>	0.5	0				
15. Sediment on plants or debris	0	0.5	1	1.5				
16. Organic debris lines or piles	0	0.5	1	1.5				
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3				

12. Presence of Baseflow	0	1		3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	<b>(T)</b>	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 12 )				

C. Blology (Subtotal = $12$				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1_	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0)	1	2	3
22. Fish	0	0.5		1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	1	1.5
26 Wetland plants in streamhed		FACW = 0.75	OBL = 1.5 Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet 06-STR-02



		Stre			ment		(Fori	m 1)			
				wadeable chan	nels classified a	s intermittent or	perennial		Impact/SAR	Impact	
Project #		Project Name	•	Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A	DC2RVA - Area 02 VA		R2SB	02070011	10/12/2015						
	e(s) of Evaluat	. ,	Stream Nam	e and Informa	ation	02.67	FD 60				
	dnik, W. Moo					02-S	R-69				
Channel	Condition: Asse			C	ondition (erosion, conditional Catego						
	Opti	imal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
		Who have	Slightly incised, fu	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally u		Deeply incised	(or executed)	
Channel Condition	Very little incision of 100% stable bar surface protection prominent (80-1) Stable point bars', are present. Acce floodplain or fully bankfull benches. and transverse be	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to skfull and low flow II defined. Stream o bankfull benches, d floodplains along	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Majo are near vertical. E 60-80% of banh protection preser banks, and is insul erosion. AND/OF stream is covere Sediment is tempo nature, and contrib AND/OR V-shape	rosion present on its. Vegetative it on 20-40% of ficient to prevent 60-80% of the d by sediment. prary/transient in uting to instability.	vertical/lateral in: incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank slo Erosion/raw ban	stability. Severe tained within the do below average tajority of banks ut. Vegetative in less than 20% of venting erosion. Sughing present. It is on 80-100%.	
	sediment depositio	on covers less than bottom.	sediment cover	reach. Transient is 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protectic 40% of the ban sediment depos	on is present on > ks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1		2.0
								eet: 06-ST			
. RIPARIAN	N BUFFERS: A		Con	ditional Cate	gory			h may be accep	table)		
RIPARIAN Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree		gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	h may be accep			
Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a href="https://doi.org/10.100/bh/s430%">doi.org/10.100/bh/s430%</a> tree canopy cover with	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or			
Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wellands eriparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious sourfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or orther comparable conditions.			
Riparian Buffers  Condition Scores  Delineate ripaescriptors. Determine scoelow.	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % F	Tree stratum (dbh > with > 60% tree canon-maintained und located within the	imal  - 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  -5  -5  -6  -6  -6  -6  -6  -6  -6  -6	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Poor:	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>		
Riparian Buffers  Condition Scores Delineate ripa secriptors. Determine scelow. Enter the % F	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wellands e riparian areas.  5  each stream ban each by measuring Score for each r 50%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in 50%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Poor:	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5		cores*0.01)/2	CI
Riparian Buffers  Condition Scores  Delineate ripa secriptors. Determine scolow. Enter the % F	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands the riparian areas.  5  each stream ban each by measurin Score for each r 50% 0.6	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 1.2	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Poor:	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lolts, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%	NOTES>>  Cl= (Sum % RA * Si		CI 0.76
Riparian Buffers  Condition Scores  Delineate rips scriptors. Determine solow. Enter the % f Right Bank  Left Bank	Tree stratum (dbh > with > 60% tree or non-maintained und located within the located with	imal  3 inches) present anopy cover and a derstory. Wetlands er iparian areas.  5  each stream ban each by measurin Score for each r 50% 0.6 90% 0.6 aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 1.2  10% 0.85  Zes, water velocit	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks ed	Low Poor: Impervious surfaces, mine spoi lands, denuded surfaces, row crops, active feel lols, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	0.90	
Riparian Buffers  Condition Scores  Delineate rips secriptors. Determine scolow. Enter the % if Right Bank  Left Bank  INSTREAI	Tree stratum (dbh > with > 60% tree canon-maintained une located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  50%  acch stream ban each by measuring Score for each rough to the stream ban one of the strea	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 1.2  10% 0.85  zes, water velocit exes, stable feature	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks economic condition area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.90	
Condition Scores Delineate ripescriptors. Determine scelow. Enter the % f Right Bank Left Bank Left Banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree co non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands to riparian areas.  5  each stream ban each by measurin Score for each r 50% 0.6  90% 0.6  aried substrate si iffle poole completimal	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 1.2  10% 0.85  zes, water velocit exes, stable featur  Subo Stable habitat elei	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  W.  In Category  Mar  Stable habitat ele	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks ed.  Blocks ed.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.90	
Condition Scores  Delineate rips escriptors. Determine scelebrate lemter the % f Right Bank  Left Bank  INSTREAI ndercut banks; Instream	Tree stratum (dbh > with > 60% tree co non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  50%  ach stream ban each by measuring score for each roughly cover and a derstory.  50%  0.6  90%  0.6  arried substrate siffle poole completimal  re typically present	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 1.2  10% 0.85  zes, water velocit exes, stable featur  Suboy Stable habitat ele present in 30-50% are adequate fo	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrud layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High 0.85  Calculators are provided at Category Mar Stable habitat ele present in 10-30 are adequate for are dequate for a sea dequate for a se	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Ri Blocks ed	Low Poor: Impervious surfaces, mine spoi lands, denuded surfaces, row crops, active feel lols, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.90	

Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX	VA	R2SB	02070011	10/12/2015	02-STR-69			
	EL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, , spoil piles, constrictions, livestock  Conditional Category							NOTES>>	
	Negligible	Mi	nor	Mod	erate	Severe			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Typical view of stream

Top Right: Typical view of stream with gaslin ROW

Bottom Left: TypicI view of stream Bottom Right: View of culvert under railroad

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

**Date:** October 12, 2015

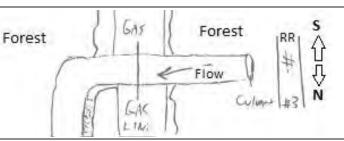
02-STR-69

Latitude: 38.414141

Evaluator: J. Budnik, W. Moorhead	County: Staffor	rd	Longitude: -77	Longitude: -77.362321		
<b>Total Points:</b> 40 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		ination (circle ene) ermittent (Perennial	Other e.g. Quad Name:	Other e.g. Quad Name:		
A. Geomorphology (Subtotal = 13)	Absent	Weak	Moderate	Strong (3)		
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)		
2. Sinuosity of channel along thalweg	0	1	2	3		
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	Ű	2	3		
Particle size of stream substrate	0	0	2	3		
5. Active/relict floodplain	0	1	(2)	3		
6. Depositional bars or benches	0	11	2	3		
7. Recent alluvial deposits	0	(1)	2	3		
3. Headcuts	0	1	2	3		
9. Grade control	(i)	0.5	1	1.5		
10. Natural valley	0	0.5	(1)	1.5		
11. Second or greater order channel  artificial ditches are not rated; see discussions in manual	N	o = 0	Yes (3)			
B. Hydrology (Subtotal = 10.5)  12. Presence of Baseflow	0	1	2	(3)		
13. Iron oxidizing bacteria	0	1	(2)	3		
14. Leaf litter	(1.5)	1	0.5	0		
15. Sediment on plants or debris	0	0.5	1	1.5		
16. Organic debris lines or piles	0	0.5	1 _	1.5		
17. Soil-based evidence of high water table?	N	0 = 0	Yes = 3			
C. Biology (Subtotal = 16.5	<b>'</b>					
18. Fibrous roots in streambed	3	(2)	1	0		
19. Rooted upland plants in streambed	(3)	2	1	0		
20. Macrobenthos (note diversity and abundance)	0	1	2	(3)		
21. Aquatic Mollusks	0	1	(2)	3		
22. Fish	0	0.5	Y	1.5		
23. Crayfish	0	0.5	1	1.5		
24. Amphibians	0	0.5	1	1.5		
25. Algae	0	0.5	1	1.5		
26. Wetland plants in streambed		FACW = 0.75; OB	1 - 15 Other - 0	)		

Sketch:

Notes: Field Sheet 06-STR-03. Top of LB.



		Otile	am A		lethodology f		_				
					nels classified a				I	lana a sa t	
Project #	ı	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area		VA	R2UB	02070011	10/12/2015				
	e(s) of Evalua dnik, W. Moo	. ,	Stream Nam	e and Informa	ation	02-ST	R-70a				
	Condition: Asse		tion of the stream	and prevailing of	ondition (erosion		1X-7 0a				
	Opti				Conditional Catego		Po	or	Sev	voro.	
		W P	1		Often incised, but	less than Severe or	Overwidene	ed/incised.	1	5	
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse be sediment depositio	nks. Vegetative n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient on covers less than	erosion or unproted of banks are st Vegetative protect prominent (60-Depositional feat stability. The bar channels are wellikely has access to or newly develope portions of the r	ew areas of active ted banks. Majority table (60-80%). tion or natural rock 80%) AND/OR ures contribute to ktfull and low flow Il defined. Stream to bankfull benches, d floodplains along each. Transient s 10-40% of the	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositio stability, may be	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may rout. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present. ed channels have	widen further. Majo	prity of both banks rosion present on its. Vegetative int on 20-40% of fficient to prevent to 60-80% of the d by sediment. orary/transient in uting to instability. d channels have		stability. Severe trained within the ad below average agiority of banks ut. Vegetative on less than 20% of eventing erosion. bughing present. ks on 80-100%. g channel. Greater	
	10% of	bottom.		bottom.	banks and depositi	on on > 40% of the onal features which to stability.	40% of the ban sediment depos		deposition, contrib Multiple thread of subterran	uting to instability. channels and/or	C
Score	3	3	2	.4	:	2	1.	6	1		2.
NOTES>>			Becomes	s more marg	jinal near ra	ilroad fill. Fi	eld Sheet 06	-STR-04.			
	N BUFFERS: A		c's 100 foot riparia	an areas along the	e entire SAR. (roi	ugh measuremen	ts of length & widt	h may be accep	NOTES>>	Wetland in	
	Opti	imal  > 3 inches) present, aderstory. Wetlands	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the	e entire SAR. (roi			h may be accep		area, ower ownstream	
2. RIPARIAI Riparian Buffers	Tree stratum (dbh : with > 60% tree cc non-maintained una located within th	imal  > 3 inches) present, anopy cover and a defestory. Wellands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree strain (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	can areas along the ditional Categorium Cate	e entire SAR. (ron gory  Mary  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> left riperian pipeline in I portion of d	area, ower ownstream	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % l	Tree stratum (dbh : with > 60% tree cc non-maintained una located within th	imal  > 3 inches) present, anopy cover and a deststory. Weltands e riparian areas.  5.5  each stream ban each by measuring.	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tweth <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> left riperian pipeline in I portion of d	area, ower ownstream	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh : with > 60% tree conon-maintained un located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands er iparian areas.  5 each stream ban seach by measuring	Con Subor High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tweth <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> left riperian pipeline in I portion of d east of railro	area, ower ownstream oad	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % l	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands er iparian areas.  5  each stream ban each by measurin Score for each r 80% 1.2 90%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.6	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tweth <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> left riperian pipeline in I portion of d east of railro  Cl= (Sum % RA * S Rt Bank Cl >	area, ower ownstream oad  cores*0.011//2 1.08	
Riparian Buffers  Condition Scores  Delineate rip descriptors. Enter the % Right Bank  Left Bank	Tree stratum (dbh a with > 60% tree co conon-maintained una located within the located wi	imal  3 inches) present, anopy cover and a deferstory. Wellands e riparian areas.  5  each stream ban each by measurin Score for each r 80% 1.2  90% 0.75	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 20% 0.6	an areas along the ditional Categories and Council Categories and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Calculators are prove.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stablized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ex	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%	NOTES>> left riperian pipeline in I portion of d east of railre  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	area, ower ownstream oad  cores*0.01//2 1.08 0.76	C:
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % Right Bank Left Bank 3. INSTREAL	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	imal  3 inches) present, anopy cover and a derstory. Wetlands er iparian areas.  5  each stream ban each by measurin Score for each r 80% 1.2 90% 0.75 aried substrate si	Con Subor  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.6  10% 0.85  Zes, water velocit exes, stable featur	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and depths; wo res.  Conditionaptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Calculators are proview.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  priss; stable substr	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> left riperian pipeline in I portion of d east of railro  Cl= (Sum % RA * S Rt Bank Cl >	area, ower ownstream oad  cores*0.01//2 1.08 0.76	
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % Right Bank Left Bank 3. INSTREAL undercut banks;	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th  1. arian areas along the strategy of the stratum (dbh : strategy of the strategy	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5.5  each stream ban each by measuring Score for each race and ra	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.6  10% 0.85  zes, water velocit exes, stable featur Subo Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Coungth and width. Coungth and width. Coungth and width. Coungth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with +30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel foliations.  Low 0.5  Low 0.5  Low 0.5  Low 0.5  Low 100%  100%	NOTES>> left riperian pipeline in I portion of d east of railre  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>> C narrow	area, ower ownstream oad  cores*0.01//2 1.08 0.76	

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project#	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2UB	02070011	10/12/2015	02-STR-70a		
	ALTERATION: Stream cross poil piles, constrictions, livestock	NOTES>>							
	Negligible	Mi	Conditiona nor		erate	Sev	rere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel alterations listed in	is disrupted by any of the channel	Greater than 8 disrupted by an alterations listed guidelines AND/0	in the parameter OR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Typical View of stream

Top Right: View across stream to forested wetland

Bottom Left: Typical view of stream between gasline ROW and forested wetland

Bottom Right: Typical view of stream between gasline ROW and forested wetland

NC DWQ Stream Identification Form Version 4.11

02-STR-70a

Date: October 12, 2015	Project/Site: DC2RVA - Area 02	Latitude: 38.412104
Evaluator: J. Budnik, W. Moorhead	County: Stafford	Longitude: -77.362905
<b>Total Points:</b> 33.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle ene) Ephemeral Intermittent (Perennial)	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*	Epitemeral litte	militerit (Ferenii)	e.g. Quad Name.	
A. Geomorphology (Subtotal = 13.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	Y	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	Y	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	<b>(</b> 0)	1	2	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No	= 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual	·			
B. Hydrology (Subtotal = $8.5$ )				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes	= 3
C. Biology (Subtotal = 11.5)	•			
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3

21. Aquatic Mollusks 1.5 0.5 22. Fish 23. Crayfish 0 0.5 1.5 24. Amphibians 1.5 0 0.5 25. Algae 0 0.5 FACW = 0.75; OBL = 1.5 Other = 0 26. Wetland plants in streambed

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet 06-SRT-04.

Sketch:

Forest Upland

		Stre				Form	(For	m 1)			
D		Danie of Name			nels classified a	s intermittent or		045 "	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area	02 Stream Name	VA	R2UB	02070011	10/13/15				
	e(s) of Evalua dnik, W. Moo	. ,	Stream Name	e and imorni	ation	02-ST	R-70b				
	ondition: Asse		etion of the stream	and prevailing c	ondition (erosion		17 700				
· Onamor o	Opti				Conditional Catego		Po	Or.	Sev	oro	
	У	illiai	Subo	pulliai	Iviai	giriai	1	OI	Jev	ele //	
	1	WA SHOW	Slightly incised, fe	ew areas of active	Poor. Banks more	less than Severe or stable than Severe		unstable. Likely to	Deeply incised	(or excavated).	
Channel Condition	Very little incision of 100% stable bar surface protection prominent (80-1). Stable point bars/are present. Acce floodplain or fully bankfull benches. and transverse bars.	n or natural rock, 00%). AND/OR bankfull benches ess to their original developed wide Mid-channel bars,	of banks are st Vegetative protect prominent (60- Depositional feat stability. The ban channels are wel likely has access to or newly developed	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR ures contribute to takfull and low flow II defined. Stream to bankfull benches, d floodplains along	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be isient, contribute on that contribute to	widen further. Majare near vertical. E 60-80% of banl protection presei banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib	rosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious bank ske Erosion/raw bank	stability. Severe tained within the do below average lajority of banks ut. Vegetative in less than 20% of venting erosion. Dughing present. ks on 80-100%.	
		n covers less than	sediment cover	each. Transient s 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have ion on > 40% of the ional features which to stability.	AND/OR V-shape vegetative protectic 40% of the bar sediment depos	on is present on > aks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1		2.4
NOTES>>				F	ield Sheet 0	6-STR-04-2-	1.				
. RIPARIAN	N BUFFERS: A	Assess both bank	s's 100 foot riparia	in areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt	h may be accep	table)		
	Opti	imal		ditional Cate		ginal	Po	or	NOTES>>		
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, tralls, or other comparable conditions.			
			High	Low	High	Low	High	Low			
Condition Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
escriptors.  Determine square	arian areas along o uare footage for e Riparian Area and	each by measurin	g or estimating le	ngth and width. (	Calculators are pr	•	Ensure the of % R	iparian			
Right Bank	% Riparian Area> Score >	100% 1.5						100%	01 (0::== 0: 50 = 5	*************	
	% Riparian Area>	50%	50%					100%	CI= (Sum % RA * S Rt Bank CI >	1.50	CI
Left Bank	Score >	1.5	0.6						Lt Bank CI >	1.05	1.28
INSTREAM	M HABITAT: Va				ody and leafy deb	oris; stable substr	ate; low embeded	ness; shade;	NOTES>>	Stream	
	root mats; SAV; ri	ille poole comple	exes, stable reatul	conditiona	l Category				stretch is a beaver impo		
ndercut banks;									weaver iiiibt		i e
	Opti	imal		ptimal		ginal ments are typically	Po Habitat elements				
Instream	_	re typically present	Stable habitat eler present in 30-50% are adequate for	ptimal ments are typically 6 of the reach and r maintenance of ations.	Stable habitat ele present in 10-30% are adequate fo	ginal ments are typically % of the reach and or maintenance of lations.	Habitat elements lacking or are ur elements are typica than 10% of	listed above are estable. Habitat ally present in less			CI

	St	ream In	pact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	csx		VA	R2UB	02070011	10/12/2015	02-STR-70b		
	- ALTERATION: Stream cross poil piles, constrictions, livestock		Conditiona	I Category				NOTES>> channel was dugout at se	
-	Negligible	Mir	nor	Mod	erate	Sev	ere	augout at 3	onic point
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		of the channel in the parameter PR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Let: Typical view of stream below beaver impoundment

Top Right: Beaver impoundment

Bottom Left: Typical view of stream above beaver impoundment Bottom Right: Typical view of stream above beaver impoundment

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

**Date:** October 12, 2015

02-STR-70b

Latitude: 38.407608

Evaluator: J. Budnik, W. Moorhead	County: Staffor	d	Longitude: -77	7.363678
<b>Total Points:</b> 38 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle ene) ermittent (Perennial	Other e.g. Quad Name:	:
A. Geomorphology (Subtotal = 17	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	(3)
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	9	3
9. Grade control	9	0.5	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	N	0 = 0	Yes	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $6.5$ )				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles		0.5	<u> </u>	1.5
17. Soil-based evidence of high water table?		0 = 0	Yes	
C. Biology (Subtotal = 14.5		l .		
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	1	(2)	3
22. Fish	0	0.5	$\rightarrow$	1.5
23. Crayfish	0	0.5	$\rightarrow$	1.5
24. Amphibians	0	0.5	$\overline{}$	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed			BL = 1.5 Other = 0	
*perennial streams may also be identified using other meth-	ods. See p. 35 of manua			
Notes: Impounded by beaver activity, might be in			04-2	
Sketch: N,NE	- Atron	· • • • • • • • • • • • • • • • • • • •	2=	
V	Gas ROW		_	
17-1-				
====	1111	1 1 1		

		Stre		SSESS fied Stream N			(For	m 1)			
				wadeable chan							
Project #	Р	Project Name	)	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	02	VA	R2SB	02070011	10/13/15				
	ne(s) of Evaluate	. ,	Stream Nam	e and Informa	ation						
	dnik, W. Moor						R-70c				
Channel C	Condition: Asses	ss the cross-sec	tion of the stream		ondition (erosion, conditional Catego						
	Optin	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	/ere	
	" Lake	JAN A	T			less than Severe or	Overwiden		1	5	
Channel Condition	Very little incision or 100% stable banl surface protection prominent (80-10 Stable point bars/b are present. Acces floodplain or fully of bankfull benches. N	ks. Vegetative or natural rock, 10%). AND/OR ankfull benches as to their original developed wide	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to	ew areas of active cted banks. Majority table (60-80%). tion or natural rock e-80%) AND/OR cures contribute to hkfull and low flow III defined. Stream to bankfull benches, d floodplains along	or Poor due to lo Erosion may be pro both banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sec temporary/tran	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may crcut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to that contribute to the severe severe severe that severe severe that br>that severe that br>that severe that severe that severe that that severe that that severe that severe that severe that that severe that	Vertically/laterally widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/OI stream is covere Sediment is temp nature, and contril	ority of both banks rosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. orary/transient in	vertical/lateral in incision, flow cor banks. Streamber rooting depth, metrical/undercorrotection present of banks, is not pre Obvious bank sle	(or excavated), stability. Severe nationed within the bed below average najority of banks but. Vegetative on less than 20% of eventing erosion. Oughing present.	
	and transverse bar sediment deposition 10% of b	covers less than	portions of the r sediment cover	reach. Transient is 10-40% of the bottom.	stability, may be AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the onal features which to stability.	AND/OR V-shape vegetative protecti 40% of the bar	ed channels have on is present on > nks and stable	than 80% of stream deposition, contrib	g channel. Greater n bed is covered by outing to instability. channels and/or	CI
Score	3		2	.4		2	1.	6	1	1	2.4
NOTES>>	N BUFFERS: As						). Field Sheets of length & width				
	Ontir	mal		ditional Cate					NOTES>>	Recently	
	Optir	nai					_				
Riparian Buffers	Tree stratum (dbh > with > 60% tree car non-maintained und located within the	nopy cover and a erstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 400% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	disturbed g ROW service both sides.	as pipeline	
Buffers	with > 60% tree car non-maintained under	nopy cover and a erstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) presant, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	disturbed g ROW service both sides.	as pipeline	
•	with > 60% tree car non-maintained under	nopy cover and a erstory. Wetlands riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	disturbed g ROW service both sides.	as pipeline	
Condition Scores  Delineate rip escriptors. Determine so elow.	with > 60% tree can non-maintained under located within the	nopy cover and a error. Wetlands riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low 1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processing the same pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5 he sums iparian qual 100	disturbed g ROW service both sides.	as pipeline	
Condition Scores  Delineate ripescriptors. Determine scelow. Enter the %	with > 60% tree car non-maintained under located within the	nopy cover and a error and a error. Wetlands riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in 50%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low 1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processing the same pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	disturbed g ROW service both sides.	as pipeline	
Condition Scores Delineate rip secriptors. Determine scolow. Enter the %	with > 60% tree can non-maintained under located within the	nopy cover and a error. Wetlands riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low 1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processing the same pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5 he sums iparian qual 100	disturbed g ROW service both sides.	as pipeline e road on	
Condition Scores Delineate rip secriptors. Determine scolow. Enter the %	with > 60% tree car non-maintained undd located within the located within the 1.5 parian areas along et quare footage for ea Riparian Area and S % Riparian Area > % Riparian Area>	nopy cover and a erstory. Wetlands riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 50% 0.6	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low 1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processing the same pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5 he sums iparian qual 100	disturbed g ROW servic both sides. Cl= (Sum % RA * S Rt Bank Cl >	as pipeline te road on	CI
Condition Scores  Delineate rip Socriptors. Determine solow. Enter the %  Right Bank  Left Bank  INSTREAL	with > 60% tree car non-maintained undi located within the located within the 1.5 parian areas along et quare footage for ea Riparian Area and S % Riparian Area > Score >	opy cover and a erritory. Wetlands riparian areas.  5  ach stream ban ach by measurin 50% 1.5  50% 1.5  ried substrate si	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 50% 0.6	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are prov.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75 sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5 he sums iparian qual 100 100%	disturbed g ROW service both sides.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2 1.05 1.05 Stream	CI 1.05
Condition Scores  Delineate rip secriptors. Determine scolow. Enter the %  Right Bank  Left Bank  INSTREAL	with > 60% tree can non-maintained unde located within the  1.5 parian areas along e- quare footage for ea Riparian Area and S % Riparian Area> Score >  M Riparian Area> Score >  M HABITAT: Var ; root mats; SAV; riff	opy cover and a restory. Wetlands riparian areas.  5 ach stream ban ach by measurin 50% 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category it 50% 0.6  50% 0.6  zes, water velocit exes, stable feature	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  categories and Co ngth and width. Co n the blocks below by and depths; wo res. Conditiona	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85 Indition Scores us Calculators are provided to the condition of the conditio	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 miches) present, with <30% tree canopy cover with maintained understory.  Low 0.75 sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%  100%	disturbed g ROW service both sides.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2 1.05 1.05 Stream	
Condition Scores Delineate ripescriptors. Determine scelow. Enter the % Right Bank  Left Bank  Instream Habitat/ Available	with > 60% tree can non-maintained unde located within the  1.5 parian areas along e- quare footage for ea Riparian Area and S % Riparian Area> Score >  M Riparian Area> Score >  M HABITAT: Var ; root mats; SAV; riff Optir Habitat elements are	nopy cover and a restory. Wetlands riparian areas.  5 ach stream ban ach by measurin 50% 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 50% 0.6  50% 0.6  zes, water velocit exes, stable featur Subo Stable habitat ele present in 30-50%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  categories and Co ngth and width. Co n the blocks below  by and depths; wo res. Conditiona ptimal ments are typically 6 of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85 Indition Scores us Calculators are previously and leafy detail Category  Marginal Stable habitat elepresent in 10-30%	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum, day and the stratum, day for the canopy cover with maintained understory.  Low 0.75 sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks ended to the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%  100%  Ilisted above are istable. Habitat	disturbed g ROW service both sides.  Cl= (Sum % RA*S Rt Bank CI> Lt Bank CI> Channel par	cores*0.01)/2 1.05 1.05 Stream of a linear coundment.	
Condition Scores Delineate ripescriptors. Determine scelow. Enter the % Right Bank Left Bank Linstream Habitat/	with > 60% tree car non-maintained undi located within the  1.5 parian areas along exquare footage for ea Riparian Area and S % Riparian Area> Score >  M HABITAT: Var ; root mats; SAV; riff	opy cover and a error of the restory. Wetlands riparian areas.  5  ach stream ban ach by measurin 50% 1.5  50% 1.5  ried substrate si file poole comple at your poole comple at your poole of the reach.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 50% 0.6  50% 0.6  Zes, water velocit exes, stable featur  Subop Stable habitat ele present in 30-509 are adequate fo popul	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  ategories and Co ngth and width. Co n the blocks below  ty and depths; wo res.  Conditiona ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are prov.  Indition Scores us Calculators are prov.  Stable habitat ele present in 10-30% are adequate fo popul	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking a hard tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low 0.75 sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to find Research Resear	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%  100%  Iness; shade;  or listed above are stable. Habitat ally present in less the reach.	disturbed g ROW service both sides.  Cl= (Sum % RA*S Rt Bank CI> Lt Bank CI> NOTES>> channel par beaver impo	cores*0.01)/2 1.05 1.05 Stream of a linear coundment.	

	St	ream In	npact A	ssessm	ent For	m Pag	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02070011	10/13/15	02-STR-70c		
	ALTERATION: Stream cross poil piles, constrictions, livestock	sings, riprap, conc		concrete blocks,	straightening of ch	hannel, channeliz	zation,	NOTES>> straightenin ~ 75'	Some g; riprap in
	Negligible	Mi	nor	Mod	erate	Sev	/ere	~ 13	
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	50% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or tent.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



View of armored cement tiles along bank of stream

N/A  Name(s) of  D. Mitchell, Channel Conditi  Channel Condition  Channel Condition  Stable are preflood; bankfull and tresediment  Score  NOTES>>  RIPARIAN BUFF  Riparian Buffers  Tree strawith > 6 non-mail	Optimal  de incision or active erosi % stable banks. Vegeta ce protection or natural ninent (80-100%). AND/ p point bars/bankfull ben essent. Access to their or plain or fully developed t il benches. Mid-channe ansverse bars few. Tran ent deposition covers les: 10% of bottom.   3  Most areas	Stream N  Stream N  Stream N  Stream N  Su  Slightly incis erosion or unp of banks a cv kyeletative propositional stability. The channels are likely has accurate than stream or newly deversite than the channels are likely has accurate than the channels are likely has accurate than the channels are likely as a construction of the channels are likely as a construction of the stream of the channels are likely as a construction of the stream of the channels are likely as a construction of the stream of the channels are likely as a construction of the stream of the channels are likely as a construction of the stream of the channels are likely as a construction of the stream of the channels are likely has a construction of the stream of the channels are likely has a construction of the stream of the channels are likely has a construction of the stream of the channels are likely has a construction of the stream of the channels are likely has a construction of the stream of the s	ed, few areas of active votected banks. Major are stable (60-80%). otection or natural roc (60-80%) AND/OR features contribute to a bankfull and low flow ewell defined. Stream eass to bankfull benche loped floodplains alon the reach. Transient sovers 10-40% of the eam bottom.  2.4  ther upstrea	condition (erosion Condition (erosion Conditional Catego Mar  Often incised, but Poor. Banks more or Poor due to I Erosion may be p both banks. Veg 40-60% of banks bevertical or und 60% of streas sediment. Se temporary/tra instability. Deposit stability, map b AND/OR V-shag ugestative protect banks and deposi contribute  Im less incis the entire SAR. (ro	Bas intermittent or HUC  02070011  02-S7  aggradation)  ory  ginal  Lless than Severe or e stable than Severe ower bank slopes. resent on 40-60% of tative protection on . Streambanks may errort. AND/OR 40-m is covered by ediment may be nsient, contribute to e forming/present. bed channels have tion on > 40% of the tional features which e to stability.	Porennial  Date  10/12/2015  TR-71  Po  Overwiden  Vertically/laterally viden further. Majc are near vertical; ef 60-80% of bank protection preser banks, and is insul erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape vegetative protectic 40% of the ban sediment depos  1.  ent. No GPS	add/incised.  Instable. Likely to brity of both banks rosion present on s. Vegetative int on 20-40% of fifcient to prevent at 60-80% of the d by sediment. or orany/transient in uting to instability, dchannels have on is present on > laks and stable little in its about the fifting in the fif	Deeply incised vertical/lateral in incision, flow cor banks. Streambe rooting depth, n vertical/undere rotection present banks, is not pre Obvious bank sl. Erosion/raw ban AND/OR Aggradin than 80% of strean deposition, contrib. Multiple thread subterran	Vere  I (or excavated), instability. Severe intained within the ed below average majority of banks cut. Vegetative on less than 20% of eventing erosion. loughing present. on the severe of the severe	C 2.				
Name(s) of D. Mitchell, Channel Conditi  Channel Condition  Channel Condition  Channel Condition  Stable are pre floody bankfull and fire sediment  Score  NOTES>>  RIPARIAN BUFF  Riparian Buffers  Tree stra with 5 c non-mail	DC2RVA - f Evaluator(s)  M. Rockwell  ion: Assess the cros  Optimal  de incision or active erosi % stable banks. Vegeta ce protection or natural rinnent (80-100%). AND/ p point bars/bankfull ben essent. Access to their or plain or fully developed til benches. Mid-channe ansverse bars few. Tran ent deposition covers les- 10% of bottom.  3  Most areas  FERS: Assess bott	Stream N Stream N Stream N Stream N Su Slightly incis erosion or unp of banks a Vegetative pr prominen R hes jinal ide bars, ide bars, ide than stability. The channels acci or newly deve int than sediment of se	Locality  VA  ame and Inform  eam and prevailing  aboptimal  abopt	Cowardin Class.  R4SB4  mation  condition (erosion Conditional Catego Mat  Poor, Banks more or Poor due to I Erosion may be p both banks. Vege 40-60% of banks bevertical or und 60% of streau in stability, Deposit stability, may be AND/OR V-shaq vegetative, may be be contribute stability, may be AND/OR V-shaq vegetative, may be contribute stability may be and deposit contribute stability.	HUC 02070011  02-S , aggradation)  ory reginal  less than Severe or estable than Severe or estable than Severe or estable than Severe or estable than Severe distative protection on . Streambanks may errout. AND/OR 40-m is covered by ediment may be forming/present. oed channels have tion an > 40% of the tion on > 40% of the tion on to stability.	Po  Overwidene Vertically/laterally/ widen further. Majc are near vertical. E 60-80% of banh protection prese banks, and is insul erosion. AND/OF stream is covere Sediment is verre Sediment to terre Sediment deport AND/OR V-shape vegetative protectic 40% of the ban sediment depos  1.  ent. No GPS	or  ad/incised.  unstable, Likely to brity of both banks rosion present on S. Vegetative int on 20-40% of the doty sediment, or any/transient in uting to instability. dichannels have on is present on > kas and stable itition is absent.  6  S. Field Sh	Deeply incised vertical/lateral in incision, flow cor banks. Streambe rooting depth, revertical/undere protection present banks, is not pre Obvious and sold Erosion/raw bank AND/OR Aggradin than 80% of stream deposition, contrib. Multiple threat subterran	Vere  I (or excavated), instability. Severe intained within the ed below average majority of banks cut. Vegetative on less than 20% of eventing erosion. loughing present. on the severe of the severe					
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Riparian Buffers Suffers	FERS: Assess both	bank's 100 foot rip	parian areas along t	the entire SAR. (ro	•				R-03.					
Buffers non-mai				Mai	rginal	Po	or	NOTES>> forest on b	Mature both banks					
	ratum (dbh > 3 inches) p 60% tree canopy cover- intained understory. We ted within the riparian are	nd a to 60% tree	with ree stratum (dbh > 3 inches present, with > 30% tree canop cover and a maintained understory. Recent cutover a (dense led	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present,	Low Marginal: Non-maintained, dense herbaceous vegetation, siparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a <="" href="https://doi.&lt;/th&gt;&lt;th&gt;High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.&lt;/th&gt;&lt;th&gt;Low Poor:&lt;/th&gt;&lt;th&gt;consisting&lt;br&gt;American I&lt;br&gt;tulip popla&lt;/th&gt;&lt;th&gt;mainly of beech and&lt;/th&gt;&lt;th&gt;&lt;/th&gt;&lt;/tr&gt;&lt;tr&gt;&lt;th&gt;&lt;/th&gt;&lt;th&gt;&lt;/th&gt;&lt;th&gt;High&lt;/th&gt;&lt;th&gt;Low&lt;/th&gt;&lt;th&gt;High&lt;/th&gt;&lt;th&gt;Low&lt;/th&gt;&lt;th&gt;High&lt;/th&gt;&lt;th&gt;Low&lt;/th&gt;&lt;th&gt;&lt;/th&gt;&lt;th&gt;&lt;/th&gt;&lt;th&gt;&lt;/th&gt;&lt;/tr&gt;&lt;tr&gt;&lt;td&gt;Condition&lt;br&gt;Scores&lt;/td&gt;&lt;td&gt;1.5&lt;/td&gt;&lt;td&gt;1.2&lt;/td&gt;&lt;td&gt;1.1&lt;/td&gt;&lt;td&gt;0.85&lt;/td&gt;&lt;td&gt;0.75&lt;/td&gt;&lt;td&gt;0.6&lt;/td&gt;&lt;td&gt;0.5&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;/tr&gt;&lt;tr&gt;&lt;td&gt;Delineate riparian are escriptors. Determine square foo elow. Enter the % Riparian&lt;/td&gt;&lt;td&gt;otage for each by me&lt;/td&gt;&lt;td&gt;suring or estimatin&lt;/td&gt;&lt;td&gt;ng length and width.&lt;/td&gt;&lt;td&gt;Calculators are p&lt;/td&gt;&lt;td&gt;•&lt;/td&gt;&lt;td&gt;Ensure the of % Ri&lt;/td&gt;&lt;td&gt;iparian&lt;br&gt;qual 100&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;/tr&gt;&lt;tr&gt;&lt;td&gt;Right Bank&lt;/td&gt;&lt;td&gt;rian Area&gt; 100%&lt;br&gt;core &gt; 1.2&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;100%&lt;/td&gt;&lt;td&gt;-&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;/tr&gt;&lt;tr&gt;&lt;td&gt;· ·&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;Cl= (Sum % RA * S&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;/tr&gt;&lt;tr&gt;&lt;td&gt;Left Bank&lt;/td&gt;&lt;td&gt;rian Area&gt; 100%&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;100%&lt;/td&gt;&lt;td&gt;Rt Bank CI &gt;&lt;/td&gt;&lt;td&gt;1.20&lt;br&gt;1.20&lt;/td&gt;&lt;td&gt;1.2&lt;/td&gt;&lt;/tr&gt;&lt;tr&gt;&lt;td&gt;. INSTREAM HAB&lt;/td&gt;&lt;td&gt;BITAT: Varied subst&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;woody and leafy de&lt;/td&gt;&lt;td&gt;bris; stable substr&lt;/td&gt;&lt;td&gt;ate; low embeded&lt;/td&gt;&lt;td&gt;ness; shade;&lt;/td&gt;&lt;td&gt;NOTES&gt;&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;/tr&gt;&lt;tr&gt;&lt;td&gt;Inctroom&lt;/td&gt;&lt;td&gt;ats; SAV; riffle poole o&lt;/td&gt;&lt;td&gt;omplexes, stable for&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;nal Category&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;-&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;/tr&gt;&lt;tr&gt;&lt;td&gt;Instream&lt;br&gt;Habitat/&lt;/td&gt;&lt;td&gt;Optimal&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;ıboptimal&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;rginal&lt;/td&gt;&lt;td&gt;Po&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;/tr&gt;&lt;tr&gt;&lt;td&gt;Available Habitat&lt;/td&gt;&lt;td&gt;alamanta ar- +-:" td=""><td>esent present in 30</td><td>t elements are typicall 0-50% of the reach and</td><td>d present in 10-30</td><td>ments are typically of the reach and</td><td>Habitat elements lacking or are un elements are typica</td><td>stable. Habitat</td><td>;</td><td></td><td></td></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a>	esent present in 30	t elements are typicall 0-50% of the reach and	d present in 10-30	ments are typically of the reach and	Habitat elements lacking or are un elements are typica	stable. Habitat	;		
Score	elements are typically peater than 50% of the rea	cn.   are adequa	te for maintenance of	are adequate for	or maintenance of			1		С				

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point Project # Date SAR length Impact Factor R4SB4 02070011 10/12/2015 02-STR-71 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. is disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has been guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. SCORE 1.5 1.3 1.1 0.9 0.7 0.5 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF INSERT PHOTOS: Top Left: Typical view upstream Bottom Right: View of culvert under railroad DESCRIBE PROPOSED IMPACT:

NC DWQ Stream Identification Form Version 4.11

02-STR-71

Date: 10/12/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.405344
Evaluator: D. Mitchell, M. Rockwell	County: Stafford	Longitude: -77.364625
Total Points: 19 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemera Intermittent Perennial	Other e.g. Quad Name:

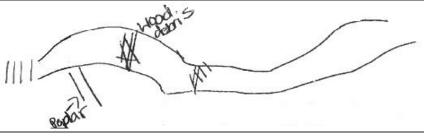
A. Geomorphology (Subtotal = 9.5)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	0	2	3
6. Depositional bars or benches	0	<b>(</b> 1 <b>)</b>	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1)	1.5
11. Second or greater order channel	No	= 0	Yes	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 3.5				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	<b>(1)</b>	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	(No	= 0	Yes	= 3

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C. Biology (Subtotal = 6				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0		2	3
21. Aquatic Mollusks	0	7	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; C	OBL = 1.5 Other = 0	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: 24" culvert. Large mature beech & tulip poplar trees present along bank. Paw-paw present. Stream has sections where it goes underground, and then reappears. Field Sheet 06-STR-03.





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				fied Stream M wadeable chan							
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	02	VA	R4SB4	02070011	10/12/2015				
	e(s) of Evaluat	` '	Stream Nam	e and Informa	ation						
	tchell, M. Roc						TR-72				
. Channel C	Condition: Asse			C	onditional Catego	ry					
	Optio	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	/ere	
	" Luke	JAKA .	Slightly incised, for	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally u		Deeply incised	(or excavated)	
Channel Condition  Very little incision or active erosion; 100% stable banks. Vegetative surface protection or natural rock prominent (80-100%). AND/OR Stable point bars/bankfull benche are present. Access to their origin; floodplain or fully developed wide bankfull benches. Mid-channel ban		ks. Vegetative or natural rock, 0%). AND/OR pankfull benches as to their original developed wide	of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along	Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Set temporary/tran instability. Depositiv.	ower bank slopes, esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to	widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in		beepy included to exceed the second of the s		
	sediment deposition 10% of b	covers less than	sediment cover	reach. Transient rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have ion on > 40% of the ional features which to stability.	AND/OR V-shape vegetative protection 40% of the band sediment depos	on is present on > ks and stable	than 80% of stream deposition, contrib Multiple thread	g channel. Greater n bed is covered by outing to instability. channels and/or nean flow.	С
Score	3		2	.4	:	2	1.	R .		1	1.6
							00 OTD 04	<u> </u>		-	- 110
NOTES>>	N BUFFERS: A	ssess both bank	c's 100 foot riparia		s incised. F				otable)		
			Con	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep	NOTES>>	Deeply	
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. RIPARIAN	Option  Tree stratum (dbh > with > 60% tree canon-maintained und	3 inches) present, nopy cover and a erstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, eor other comparable conditions.	NOTES>> incised ba Upland veç on both ba	Deeply nks. getation	
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#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Date Data Point SAR length Impact Factor Project # N/A R4SB4 02070011 10/12/2015 02-STR-72 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> Conditional Category Moderate embankments, spoil piles, constrictions, livestock Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach is disrupted by any of the channel alterations listed in stream reach is the parameter guidelines. If stream has been disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. SCORE 1.5 0.5 1.3 1.1 0.9 0.7 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF INSERT PHOTOS:



Top left: Typical view upstream Top Right: Typical view downstream Bottom Left: Culvert under railroad

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 10/12/2015

02-STR-72

Latitude: 38.40117

Evaluator: D. Mitchell, M. Rockwell  Total Points: 19	County: Staffor	ination (circle one)	Longitude: -77.367140  Other		
Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$	Ephemera Inte	ermittent Perennial	e.g. Quad Name:		
A. Coomorphology, (Sylvated, 4	Absent	Weak	Moderate	Strong	
A. Geomorphology (Subtotal = 4 )  1 <sup>a.</sup> Continuity of channel bed and bank	Absent 0	(1)	2		
Sinuosity of channel along thalweg	0	$\frac{\Box}{\Box}$	2	3	
3. In-channel structure: ex. riffle-pool, step-pool,	0		2	3	
ripple-pool sequence 4. Particle size of stream substrate		1	2	3	
5. Active/relict floodplain	8	1	2	3	
Depositional bars or benches		1	2	3	
7. Recent alluvial deposits		1	2	3	
8. Headcuts		1	2	3	
9. Grade control		0.5		1.5	
10. Natural valley		0.5	(1)	1.5	
11. Second or greater order channel	No	o = 0	Yes:		
a artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = 6)		1			
12. Presence of Baseflow	0	1	(2)	3	
13. Iron oxidizing bacteria	0	1	(2)	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	No	0	Yes :	= 3	
C. Biology (Subtotal = $9$					
18. Fibrous roots in streambed	(3)	2	1	0	
19. Rooted upland plants in streambed	(3)	2	1	0	
20. Macrobenthos (note diversity and abundance)	Ŭ	1	2	3	
21. Aquatic Mollusks	0	7	2	3	
22. Fish	(0)	0.5	11	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5		1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0		
*perennial streams may also be identified using other methods	s. See p. 35 of manua	al.			
Notes: No GPS. Field Sheet 06-STR-04.					
Sketch:					

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
		n N			nels classified a			212 "	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R4SB	02070011	10/13/2015				
	e(s) of Evaluat chell, M. Roc	. ,	Stream Nam	e and Informa	ation	02-S	ΓD_72				
	Condition: Asse		tion of the stream	and provailing or	andition (arasian		111-73				
. Onamier C				C	Conditional Catego	ry	D-		0		
	Optimal		Optimal Suboptimal		Mar	Marginal Poor		Severe			
	1	WAR OF THE PERSON OF THE PERSO		ew areas of active	Poor. Banks more	less than Severe or stable than Severe	Overwidene Vertically/laterally u	ınstable. Likely to			
Channel Condition	100% Stable banks. Vegetative		of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope portions of the r	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient	Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. See temporary/tran instability. Deposition stability, may be	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in		peepy incessed of exactively, severical/lateral instability. Severe n incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present.		
	sediment depositio 10% of I	bottom.		rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protectic 40% of the ban sediment depos	ks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	outing to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1	l	1.6
NOTES>>			Deep	ly incised l	baliks. I ici	a Officer 00	0111-05 100	aiii <b>Z</b> .			
	N BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (roi					Doonly	
	N BUFFERS: A		c's 100 foot riparia		e entire SAR. (roo			h may be accep	NOTES>>	Deeply	
Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca	a 3 inches) present, anopy cover and a derstory. Wetlands	C's 100 foot riparia  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorium l  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po- High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> incised bar Upland veç present on banks.	nks. getation	
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#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Date Data Point SAR length Impact Factor Project # R4SB 02070011 10/13/2015 02-STR-73 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> Conditional Category Moderate embankments, spoil piles, constrictions, livestock Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach is disrupted by any of the channel alterations listed in stream reach is the parameter guidelines. If stream has been disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. SCORE 1.5 0.5 1.3 1.1 0.9 0.7 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:





Top Left: Typical view downstream Top Right: Typical view upstream Bottom Left: Culvert under railroad

NC DWQ Stream Identification Form Version 4.11

02-STR-73

1.5

Date: 10/13/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.395475
Evaluator: D. Mitchell, M. Rockwell	County: Stafford	Longitude: -77.370778
<b>Total Points:</b> 20.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

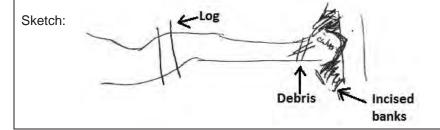
ii ≥ 19 0i pereriniarii ≥ 30				
	Alicent	M1	Bar Investo	01::
A. Geomorphology (Subtotal = 5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	Ō	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	1	2	3
9. Grade control		0.5	1	1.5
10. Natural valley		0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $6.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	T	0.5	0
15. Sediment on plants or debris	0_	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	o = 0	Yes:	= 3
C. Biology (Subtotal = $8.75$ )	_			
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	Y	1	2	3
21. Aquatic Mollusks	0	Y	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	7	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
			1 .	t

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: 48" iron culvert. Field Sheet 06-STR-05

26. Wetland plants in streambed

25. Algae



0.5

ACW = 0.75 OBL = 1.5 Other = 0

	Stre		fied Stream N	lethodology f	or use in Virg	ginia	m 1)		
Project #	Project Nam		wadeable chan  Locality	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Are	a 02	VA	R4SB	02070011	10/13/2015		iciigiii	1 dotor
Nam	ne(s) of Evaluator(s)	Stream Nam	e and Informa	ation					
D. Mi	tchell, M. Rockwell				02-S	ΓR-74			
. Channel (	Condition: Assess the cross-se	ction of the stream	and prevailing c	ondition (erosion,	aggradation)				
	Optimal	Subo	ptimal c	Conditional Catego	ry ginal	Po	or	Sev	/ere
		1		Often incised, but	less than Severe or	Overwiden	ed/incised.	1	5
Channel Condition	Very little incision or active erosion; 8 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their origina floodplain or fully developed wide bankfull benches. Mid-channel bars and transverse bars few. Transient sediment deposition covers less that	orosion or unproted of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to or newly develope portions of the r	ew areas of active ted banks. Majority table (60-80%). tion or natural rock 80%) AND/OR ures contribute to ktfull and low flow Il defined. Stream to bankfull benches, d floodplains along each. Transient \$ 10-40% of the	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositiv stability, may be	stable than Severe wer bank slopes. sesent on 40-60% of tative protection on Streambanks may rout. AND/OR 40-n is covered by diment may be sisent, contribute on that contribute to forming/present. de channels have	Vertically/laterally widen further. Maj are near vertical. E 60-80% of banih protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib. AND/OR V-shall vengetative protecti	ority of both banks rosion present on cs. Vegetative to no 20-40% of fficient to prevent 60-80% of the dby sediment. orary/transient in outing to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious banks le Erosion/raw ban	najority of banks but. Vegetative on less than 20% of eventing erosion. oughing present. iks on 80-100%. g channel. Greater
	10% of bottom.	stream	bottom.	banks and depositi	on on > 40% of the onal features which to stability.	40% of the bar sediment depos		deposition, contrib	outing to instability. channels and/or
Score	3	2	.4	:	2	1.	6	1	1
. RIPARIA	N BUFFERS: Assess both bar		an areas along the		ugh measuremen	ts of length & widt	h may be accep	ntable)	Upland
	Optimal		ptimal		ginal	Po	or	vegetation	•
Riparian Buffers	Tree stratum (dbh > 3 inches) preser with > 60% tree canopy cover and a non-maintained understory. Wetland located within the riparian areas.	to 60% tree canopy cover and containing both	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row	on both ba	-
		herbaceous and shrub layers or a non-maintained understory.	Recent cutover (dense vegetation).	inches) present, with <30% tree canopy cover.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	crops, active feed lots, trails, or other comparable conditions.		
Condition	15	shrub layers or a non-maintained understory.	Recent cutover (dense vegetation).	with <30% tree canopy cover.	present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	maintained area, recently seeded and stabilized, or other comparable condition.	crops, active feed lots, trails, or other comparable conditions.		
Scores  Delineate ripescriptors. Determine selow.	1.5  Darian areas along each stream bacquare footage for each by measur  Riparian Area and Score for each  % Riparian Area> 100%  Score > 1.1	shrub layers or a non-maintained understory.  High 1.2  nk into Condition Cong or estimating le	Recent cutover (dense vegetation).  Low 1.1  ategories and Congth and width. (	with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are presented to the canopy cover.	present, tree stratum (dbh >3 inches) present, with +30% tree canopy cover with maintained understory.  Low  0.75	maintained area, recently seeded and stabilized, or other comparable condition.	crops, active feed lots, trails, and to the comber compared to the conditions.  Low  0.5		
Scores  Delineate ripescriptors. Determine selow. Enter the %	parian areas along each stream bacquare footage for each by measur  Riparian Area and Score for each  % Riparian Area> 100%  Score > 1.1	shrub layers or a non-maintained understory.  High 1.2  nk into Condition Cong or estimating le	Recent cutover (dense vegetation).  Low 1.1  ategories and Congth and width. (	with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are presented to the canopy cover.	present, tree stratum (dbh >3 inches) present, with +30% tree canopy cover with maintained understory.  Low  0.75	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	crops, active feed lots, rails, or other comparable conditions.  Low  0.5  De sums  iparian  qual 100  100%	CI= (Sum % RA * S	,
Scores  Delineate ripescriptors. Determine selow. Enter the %	parian areas along each stream bacquare footage for each by measur  Riparian Area and Score for each  % Riparian Area> 100%  Score > 1.1  % Riparian Area> 100%	shrub layers or a non-maintained understory.  High 1.2  nk into Condition Cong or estimating le	Recent cutover (dense vegetation).  Low 1.1  ategories and Congth and width. (	with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are presented to the canopy cover.	present, tree stratum (dbh >3 inches) present, with +30% tree canopy cover with maintained understory.  Low  0.75	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	CI= (Sum % RA * S Rt Bank CI >	1.10
Scores  Delineate ripescriptors. Determine selow. Enter the % Right Bank  Left Bank  INSTREA	parian areas along each stream bacquare footage for each by measur  Riparian Area and Score for each  % Riparian Area> 100%  Score > 1.1  % Riparian Area> 100%  Score > 1.1  M HABITAT: Varied substrate	shrub layers or a non-maintained understory.  High 1.2  nk into Condition Cong or estimating le riparian category in size, water velocitisses, water velocitisses, water velocitisses.	Low 1.1  Lategories and Congth and width. (an the blocks below	with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the canopy cover.	present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks et al.	crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Les sums sparian 100  100%	CI= (Sum % RA * S	,
Scores  Delineate ripescriptors. Determine selow. Enter the % Right Bank  Left Bank  INSTREA	parian areas along each stream bacquare footage for each by measur  Riparian Area and Score for each  % Riparian Area> 100%  Score > 1.1  % Riparian Area> 100%  Score > 1.1  M HABITAT: Varied substrate s; root mats; SAV; riffle poole comp	shrub layers or a non-maintained understory.  High 1.2  nk into Condition Cong or estimating le riparian category in sizes, water velocitiexes, stable feature.	Low  1.1  Lategories and Congth and width. (an the blocks below y and depths; wores.  Conditiona	with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are prov.  ody and leafy det  Il Category	present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks ed  ate; low embeded	crops, active feed lots, trails, active feed lots, trails, conditions.  Low 0.5  ne sums liparian loud 100%  100%	C⊫ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	1.10
Delineate ripescriptors. Delermine selow. Enter the % Right Bank  Left Bank  INSTREA Indecut banks  Instream Habitat/ Available	parian areas along each stream bacquare footage for each by measur  Riparian Area and Score for each  % Riparian Area> 100%  Score > 1.1  % Riparian Area> 100%  Score > 1.1  M HABITAT: Varied substrate continuation of the proof of the proo	shrub layers or a non-maintained understory.  High 1.2  Ink into Condition Cong or estimating le riparian category in sizes, water velocit lexes, stable featu Subo Stable haitat ele tripresentia 30-50%	Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. (an the blocks below years)  y and depths; wores.  Conditiona ptimal  ments are typically 6 of the reach and	with <a href="https://doi.org/10.100/j.com/30%">https://doi.org/10.100/j.com/30%</a> tree canopy cover.  High  0.85  Indition Scores us Calculators are provedured by the second of the	present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substrations; stable substrations are typically 6 of the reach and	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks en Blocks	crops, active feed lots, trails, active feed lots, trails, conditions.  Low 0.5  Les urms ipparian 100  100%  100%  Or listed above are stable. Habitat	CI= (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>>	1.10
Scores Delineate ripescriptors. Determine seleow. Enter the % Right Bank Left Bank Left Bank INSTREA Indercut banks Instream Habitat/	parian areas along each stream bacquare footage for each by measur  Riparian Area and Score for each  % Riparian Area> 100%  Score > 1.1  % Riparian Area> 100%  Score > 1.1  M HABITAT: Varied substrate strong mats; SAV; riffle poole components	shrub layers or a non-maintained understory.  High 1.2  Ink into Condition Cong or estimating le riparian category in parian category in sizes, water velocit lexes, stable feature Subo Stable habitat ele present in 30-500 are adequate for popul	Low 1.1  Lategories and Congth and width. (an the blocks below by and depths; wo res.  Conditional primal ments are typically ments are typically	with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are prov.  I Category  War  Stable habitat ele present in 10-30% are adequate fo popul	present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks end  ate; low embeded	crops, active feed lots, rails, controller comparable conditions.  Low  0.5  ne sums iparian qual 100  100%  100%  or listed above are stable. Habitat ally present in less the reach.	CI= (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>>	1.10

### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point Impact Factor Project # Date SAR length R4SB 02070011 10/13/2015 02-STR-74 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by any of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is the parameter guidelines. If stream has been disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. is disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has been shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. SCORE 1.5 1.3 1.1 0.9 0.7 0.5 1.50

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5 0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

### INSERT PHOTOS:



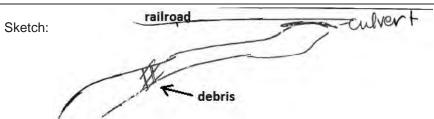
View of culvert under railroad

NC DWQ Stream Identification Form Version 4.11

02-STR-74

Project/Site: DC2RVA - Area 02	<b>Latitde:</b> 38.390307
County: Stafford	Longitude: -77.373922
Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:
	County: Stafford  Stream Determination (circle one)

A. Geomorphology (Subtotal = 4.5)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	<b>(</b> 1)	2	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	7	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
B. Headcuts	0	1	2	3
). Grade control	0	0.5	1	1.5
0. Natural valley	0	0.5	1	1.5
Second or greater order channel	No	0 = 0	Yes	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 7				
2. Presence of Baseflow	0	1	2	3
3. Iron oxidizing bacteria	0	<b>(</b> 1 <b>)</b>	2	3
4. Leaf litter	(1.5)	<u> </u>	0.5	0
15. Sediment on plants or debris		0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
C. Biology (Subtotal = $9.25$				
8. Fibrous roots in streambed	(3)	2	1	0
9. Rooted upland plants in streambed	(3)	2	1	0
0. Macrobenthos (note diversity and abundance)	ď	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
4. Amphibians	0	0.5	1	1.5
5. Algae	0	0.5	1	1.5
6. Wetland plants in streambed		<b>EACW</b> = 0.75	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other metho	ods. See p. 35 of manua	al.		



				perennial	intermittent or p	nels classified as	n wadeable chan	For use in			
	Impact Factor	Impact/SAR length	SAR#	Date	HUC	Cowardin Class.	Locality		Project Name	ı	Project #
				08/11/2016	02070011	R4SB	VA	02	C2RVA - Area	_	N/A
				ΓD_75	02-S1	tion	e and Informa	Stream Name		e(s) of Evaluat gering, R. P	
				1117.5		dition (erosion, ago	and prevailing cond	on of the stream a		ondition: Asses	
	ere	Sev	oor	Po		Conditional Categor		1		Opti	
		4	Charles and the second	The state of the s		1			المراد		
CI	stability. Severe talaned within the d below average ajority of banks egetative protection n 20% of banks, is ion. Obvious bank Erosion/raw banks D/OR Aggrading nan 80% of stream by deposition, stability. Multiple d/or subterranean	Deeply incised ( vertical/lateral insincision, flow con banks. Streambe rooting depth, m vertical/undercut. Vy present on less than not preventing erosi sloughing present. on 80-100%. AND channel. Greater the bed is covered contributing to institute of the stream of t	unstable. Likely to jority of both banks rosion present on 60-getative protection % of banks, and is ent erosion. AND/OR eam is covered by Sediment is ent in nature, and ability. AND/OR V-s have vegetative nt on > 40% of the diment deposition is	widen further. Maj are near vertical. Er 80% of banks. Ve present on 20-40° insufficient to preve 60-80% of the stre sediment. S temporary/transic contributing to instat shaped channels protection is prese	stable than Severe wer bank slopes. seent on 40-60% of ive protection on 40-forman banks may rout. AND/OR 40-vered by sediment. emporary/transient, ty. Deposition that ability, may be ND/OR V-shaped tative protection on s and depositional	60% of banks. S bevertical or unde 60% of stream is co Sediment may be t contribute instabilit contribute to st forming/present. A	tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow efined. Stream likely nkfull benches, or floodplains along reach. Transient 0-40% of the stream	erosion or unprotect of banks are st Vegetative protect prominent (60-Depositional feat stability. The bar channels are well de has access to ban newly developed portions of the r	Vegetative surface al rock, prominent I/OR Stable point ches are present. ginal floodplain or e bankfull benches. and transverse bars diment deposition	Very little incision or 100% stable banks. protection or nature (80-100%). AND bars/bankfull ben Access to their ori, fully developed wid Mid-channel bars, a few. Transient sec covers less than	Channel Condition
2.0		1	.6	1.	2	2	.4	2	3	3	Score
	area	NOTES>>The		elength & width ma	measurements of	. •	areas along the en	•	ssess both bank's	BUFFERS: As	. RIPARIAN
		adjacent to th		Po	ginal	Marg	ptimal	Subo	imal	Opti	
	regetation. nvegetated	primarily ope herbaceous v Some bare/ur areas area als	Low Poor:	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh -3 inches) present, with <a href="campy cover with maintained">campy cover with maintained understory.</a>	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	anopy cover and a derstory. Wetlands	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the	Riparian Buffers
			1	112-4	-	10.4					Condition
			Low 0.5	High 0.6	Low	High 0.85	Low 1 1	High	5	1	
			Low 0.5 the sums Riparian equal 100 100%	0.6  Ensure t	Low 0.75 the descriptors.	0.85	1.1 egories and Condith and width. Calc	1.2 Into Condition Cate or estimating leng	ach stream bank i	rian areas along ea uare footage for ea iparian Area and S % Riparian Area>	Determine squ
			0.5 the sums Riparian equal 100 100%	0.6  Ensure t	Low 0.75 the descriptors.	0.85	egories and Cond th and width. Calc	1.2 Into Condition Cate or estimating leng	ach stream bank in the stream ba	rian areas along ea uare footage for ea iparian Area and S	Delineate ripar
CI	ores*0.01)/2 1.02	CI= (Sum % RA * So Rt Bank CI >	0.5 the sums Riparian equal 100 100%	0.6  Ensure t	Low 0.75 the descriptors.	0.85	1.1 egories and Cond th and width. Calc ne blocks below. 40%	nto Condition Cate or estimating leng arian category in the	ach stream bank in ach by measuring Score for each rips 20%	rian areas along ea uare footage for ea iparian Area and S % Riparian Area>	Delineate ripar Determine squ Enter the % R Right Bank
CI 1.26		`	0.5 the sums Riparian equal 100 100%	0.6  Ensure t	Low 0.75 the descriptors.	0.85	1.1 egories and Cond th and width. Calc ne blocks below. 40%	nto Condition Cate or estimating leng arian category in the	ach stream bank in ach by measuring Score for each rips 20%	rian areas along ea uare footage for ea iparian Area and S % Riparian Area> Score >	Delineate ripar Determine squ Enter the % Ri
	1.02	Rt Bank CI >	0.5 the sums Riparian equal 100 100%	0.6  Ensure t  of % R  Blocks e	Low 0.75  the descriptors. ed for you below.	0.85	1.1 egories and Cond th and width. Calc ne blocks below. 40% 0.85	1.2 Into Condition Cate or estimating leng arian category in the 40% 1.1	ach stream bank in ach by measuring Score for each rips 20% 1.2 100% 1.5 ried substrate size	rian areas along ea uare footage for ea iparian Area and S % Riparian Area> Score > % Riparian Area> Score >	Delineate ripar Determine squ Enter the % Ri Right Bank Left Bank
	1.02	Rt Bank CI >	0.5 the sums Riparian equal 100 100% 100%	0.6  Ensure t  of % R  Blocks e	Low 0.75  the descriptors. ed for you below.	0.85 ition Scores using culators are provided and leafy debris; all Category	1.1 egories and Cond th and width. Calc ne blocks below. 40% 0.85 and depths; woody	1.2  nto Condition Cate or estimating leng arian category in th  40%  1.1  as, water velocity a features.	ach stream bank in ach by measuring Score for each rips 20% 1.2 100% 1.5 ried substrate size complexes, stable	rian areas along ea uare footage for ea iparian Area and S % Riparian Area> Score >  % Riparian Area> Score >  1 HABITAT: Var ; SAV; riffle poole of	Delineate ripar Determine squ Enter the % Ri Right Bank Left Bank . INSTREAM anks; root mats;
	1.02	Rt Bank CI >	0.5 the sums Riparian equal 100 100%	O.6  Ensure t of % R Blocks e  When the second seco	Low 0.75  the descriptors. ed for you below.  stable substrate; I	0.85  ition Scores using culators are provided and leafy debris; all Category Marg	egories and Cond th and width. Calc ne blocks below. 40% 0.85  and depths; woody Conditiona ptimal ments are typically of the reach and are maintenance of	nto Condition Cate or estimating leng arian category in the 40% 1.1  es, water velocity a features.  Subop Stable habitat eler present in 30-50%	ach stream bank in ach by measuring Score for each ripar 20% 1.2 100% 1.5 ried substrate size complexes, stable imal re typically present	rian areas along ea uare footage for ea iparian Area and S % Riparian Area> Score > % Riparian Area> Score >	Delineate ripar Determine squ Enter the % Ri Right Bank Left Bank INSTREAM

Project # Apophornt		S	tream Ir	npact A	ssessm	nent For	m Page	2		
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock    Conditional Category	Project #								SAR length	Impact Factor
Channel Alteration  Channel Alteration  Channel Channe	N/A	CSX		VA	R4SB	02070011	08/11/2016	02-STR-75	500	1
Channel Alteration  Channel Alteration  Channel Channe	4. CHANNEI	L ALTERATION: Stream crossin	ngs, riprap, concre	te, gabions, or co	ncrete blocks, stra	ightening of chann	nel, channelization,	embankments,	NOTES>>	
Channel Alteration   Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.   Channel alterations listed in the parameter guidelines.   Secore   Co. 40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.   Stream has been channelized, normal stable stream meander pattern has not recovered.   Score   1.5   1.3   1.1   0.9   0.7   0.5	spoil piles, const	trictions, livestock		Condition	al Catoner:				4	
Channel Alteration  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  SCORE  1.5  1.3  1.1  0.9  O'W of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  SCORE  1.5  1.3  1.1  0.9  O'TE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  Alteration  Less than 20% of the channel is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  O'TE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  Alteration  Less than 20% of the channel is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  O'TE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  Alteration  Channelization, dredging, alteration, or hardening absent. Stream has an unalterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  O'TE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCl) >>  RCl= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (CR) >>  CR = RCl X LF X IF		Negligible	Mi			lerate	Sev	ere	1	
SCORE 1.5 1.3 1.1 0.9 0.7 0.5  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF		Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	Greater than 80% o by any of the chan in the parameter g 80% of banks sh	f reach is disrupted el alterations listed uidelines AND/OR ored with gabion,		
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	SCORE	1.5	1.3	1.1			0.	5		
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF		REACH	CONDITION	INDEX and S	TREAM COI	NDITION UN	ITS FOR THIS	REACH		
RCI= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	NOTE: The CIs and F								CONDITION IN	IDEX (RCI) >>
COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF										
								COMPENSAT	TION REQUIRE	
INSERT PHOTOS:								CR = RC	I X LF X IF	
l I										
DESCRIBE PROPOSED IMPACT:	DESCRIBE F	PROPOSED IMPACT:								

1

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 08/11/2016

02-STR-75

Evaluator: L. Postaski, R. Porath	County: Staffor	d	Longitude: -77	.373749
<b>Fotal Points:</b> 20.5  Stream is at least intermittent f ≥ 19 or perennial if ≥ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 10.5	Absent	Weak	Moderate	Strong
a. Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1)	2	3
B. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
5. Depositional bars or benches	0	1	2	3
. Recent alluvial deposits	0	1	2	3
B. Headcuts	0	1	2	3
D. Grade control	0	0.5		1.5
0. Natural valley	0	0.5	1	1.5
Second or greater order channel	No	0 = 0	Yes =	
artificial ditches are not rated; see discussions in manual				
3. Hydrology (Subtotal = 5.0				
2. Presence of Baseflow	0	1	2	3
3. Iron oxidizing bacteria	0	1	2	3
4. Leaf litter	1.5	1	0.5	0
5. Sediment on plants or debris	0	0.5	1	1.5
6. Organic debris lines or piles	0	0.5	1	1.5
7. Soil-based evidence of high water table?	No	0 = 0	Yes =	= 3
C. Biology (Subtotal = 5.0 )				
8. Fibrous roots in streambed	3	2	1	0
9. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1. Other = 0	
*perennial streams may also be identified using other method	ls. See p. 35 of manua	al.		
Notes: 6-B-STR-4				
Notes: 6-B-STR-4				

### **Ephemeral Stream Assessment Form (Form 1a)**

Unified Stream Methodology for use in Virginia

For use in ephemeral streams								
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Area 02	VA	R6	02070011	10/14/2015			1

02-STR-76

Name(s) of Evaluator(s) Stream Name and Information

D. Mitchell, M. Rockwell

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Con	ditional Cate	gory				NOTES>>
	Optimal	Subo	ptimal	Mar	ginal	Po	oor	Field Sheet 0
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with >30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a href="mailto:s00">s00</a> % tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	Team 2.
					with <30% tree canopy cover with maintained			
		High	Low	High	Low	High	Low	
ition res	1.5	1.2	1.1	0.85	0.75	0.6	0.5	
eate ripa	arian areas along each stream ban	k into Condition C	ategories and Co	ondition Scores us	sing the	Ensure	the sums	
	quare footage for each by measurin	g or estimating le	ngth and width. (	Calculators are pr	ovided for you	of % F	Riparian	
inter the % I	Riparian Area and Score for each ri	parian category is	n the blocks below	v.		Blocks e	equal 100	
int Dank	% Riparian Area> 100%						100%	
ight Bank								

Right Bank Score > 1.1

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.55

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



Typical view of stream along railroad tracks

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 10/14/2015

02-STR-76

	<u> </u>			
Evaluator: D. Mitchell, M. Rockwell	County: Stafford		Longitude: -77	7.377389
<b>Total Points:</b> 10.5 Stream is at least intermittent f ≥ 19 or perennial if ≥ 30*	Stream Determin	nation (circle one) mittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 5)	Absent	Weak	Moderate	Strong
<sup>a.</sup> Continuity of channel bed and bank	0	1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	1	2	3
B. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	1	1.5
0. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes :	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 1.5				
2. Presence of Baseflow	0	1	2	3
Iron oxidizing bacteria	(0)	1	2	3
4. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes =	= 3
C. Biology (Subtotal = 4)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	<u> </u>	Y	2	3
21. Aquatic Mollusks	8	1	2	3
22. Fish	<b>(</b> 0 <b>)</b>	0.5	1	1.5
23. Crayfish		0.5	1	1.5
24. Amphibians		0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OBI	L = 15 Other = 0	
*perennial streams may also be identified using other methods	. See p. 35 of manual			
Notes: Field Sheet 06-STR-11 Team 2.				
Notes: Field Sheet 06-STR-11 Team 2.  Sketch:	. eee p. ee er mandar			

		Sire		SSESS fied Stream M			_	<i>,</i>			
		- · · · · · · · · · · · ·		wadeable chan	nels classified a			215 "	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A		2RVA - Area		VA	R4SB	02070011	10/13/15				
	ne(s) of Evaluat tchell, M. Roo	. ,	Stream Nam	e and Informa	ation	02-S					
	Condition: Asse		tion of the stream	and prevailing of	andition (erasion		11 / /				
· Onamior c					onditional Catego	ry	Po	-0"	l ea	/ere	
	Opti	IIIai	Subo	pumai	IVIAI	ginal	W FO	IOI	Jev.	/ere	
	1	Slightly incised, few areas of active			less than Severe or stable than Severe	Overwiden Vertically/laterally		1	5		
Channel Condition	Very little incision on 100% stable bar surface protection prominent (80-11 Stable point bars/l are present. Acce floodplain or fully bankfull benches.	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars,	erosion or unproted of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow Il defined. Stream o bankfull benches,	or Poor due to lo Erosion may be pro both banks. Veget 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran	stable than severe were bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Maj	ority of both banks Erosion present on ks. Vegetative nt on 20-40% of difficient to prevent R 60-80% of the ed by sediment. corary/transient in	incision, flow cor banks. Streambe rooting depth, n vertical/underc protection present of banks, is not pre Obvious bank sle	stability. Severe ntained within the ed below average najority of banks cut. Vegetative on less than 20% of eventing erosion. oughing present.	
	and transverse ba sediment depositio 10% of I	n covers less than	portions of the r sediment cover	d floodplains along reach. Transient rs 10-40% of the bottom.	stability, may be AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have ion on > 40% of the ional features which to stability.	AND/OR V-shape vegetative protecti 40% of the bar sediment depor	ed channels have on is present on > nks and stable		g channel. Greater in bed is covered by outing to instability. channels and/or	С
Score	3	}	2	4	:	2	1.	.6	1	1	1.
. RIPARIAI	N BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	th may be accep	table)		
2. RIPARIAI	N BUFFERS: A		Con	an areas along the ditional Cateon ptimal	gory	ugh measuremen ginal	ts of length & wid		table)		
Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, unopy cover and a lerstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained					
Riparian	Opti  Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, unopy cover and a lerstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cateceptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
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Riparian Buffers  Condition Scores  Delineate ripiescriptors. 2. Determine scorelow.	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the stratum areas along equare footage for e	mal  3 inches) present, nopy cover and a lerstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categories and Congth and width. Categories and Congth and width. Categories and with the stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate rip- escriptors. Determine scelow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	mal  3 inches) present, nopy cover and a lerstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categories and Congth and width. Categories and Congth and width. Categories and with the stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
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Condition Scores  Delineate rip: lescriptors. Descriptors. Enter the % I Right Bank  Left Bank  Left Banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	mal  3 inches) present, nopy cover and a deterstory. Wetlands er riparian areas.  5  ach stream banl ach by measurin 100% 0.85  100% 0.85  aried substrate si ffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu	ditional Categoritimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provent or shrub layer of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  pris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded dust, relias, or other comparable conditions.  Low  0.5  he sums liparian qual 100  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	0.85	
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Condition Scores  Delineate rip: lescriptors. Descriptors. Enter the % I Right Bank  Left Bank  Left Banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	mal  3 inches) present, nopy cover and a derstory. Wetlands or inpartial areas.  5  ach stream bani ach by measurin 100% 0.85 100% 0.85 aried substrate si ffle poole comple mal re typically present 1% of the reach.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditional  ments are typically who free reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically % of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e  High  Under the proper of the pr	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums cliparian qual 100 100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >  NOTES>>	0.85	

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project#	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB	02070011	10/13/15	02-STR-77		
	- ALTERATION: Stream cross poil piles, constrictions, livestock	sings, riprap, conc		concrete blocks,	straightening of ch			NOTES>>	
	Negligible	nor Moderat		erate	Severe				
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter OR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF



Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 10/13/2015

02-STR-77

Evaluator: D. Mitchell, M. Rockwell	County: Staffor	d	Longitude: -77	.380738
Total Points: 26.75	Stream Determi	ination (circle one)	Other	
Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Ephemeral inte	ermittent Perennial	e.g. Quad Name:	
II = 13 or perorinarii = 30				
A. Geomorphology (Subtotal = 10 )	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain		1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	0 = 0	Yes =	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $8.5$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes =	= 3
C. Biology (Subtotal = $8.25$		•		
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	Y	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 15 Other = 0	
*perennial streams may also be identified using other metho	ds. See p. 35 of manua			
Notes: Field Sheet 06-STR-10 Team 2.				
Sketch:				

		Stre					ı (Forı	m 1)			
				fied Stream N wadeable chan							
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		DC2RVA		VA	R2UB	02070011	09/01/2016				
	e(s) of Evaluat	` '	Stream Nam	e and Informa	ation	00.07	FD 70				
	gering, L. Pos						ΓR-78				
. Channel C	Condition: Asse			C	Conditional Catego	ry					
	Optio	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	rere	
	10	JANA .	Slightly incised, for	ew areas of active	Poor. Banks more	less than Severe or stable than Severe	Overwidene Vertically/laterally u	ınstable. Likely to	Deeply incised	(or excavated),	
Channel Condition	Very little incision or 100% stable ban surface protection prominent (80-10 Stable point bars/b are present. Acces floodplain or fully bankfull benches. I	iks. Vegetative or natural rock, 00%). AND/OR bankfull benches as to their original developed wide Mid-channel bars,	erosion or unproted of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along	Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sed temporary/tran instability. Depositi	wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Majo are near vertical. E 60-80% of bank protection preser banks, and is insul erosion. AND/OF stream is covere Sediment is tempi nature, and contrib	rosion present on is. Vegetative it on 20-40% of ficient to prevent 60-80% of the d by sediment. prary/transient in uting to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre	stability. Severe intained within the ad below average najority of banks sut. Vegetative on less than 20% of eventing erosion. pughing present.	
	and transverse bar sediment deposition 10% of b	covers less than	portions of the r sediment cover	reach. Transient rs 10-40% of the bottom.	stability, may be AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the onal features which to stability.	AND/OR V-shape vegetative protection 40% of the band sediment depos	on is present on > ks and stable	AND/OR Aggradin	g channel. Greater n bed is covered by outing to instability. channels and/or	CI
Score	3		2	4	:	2	1.	6	1	I	
NOTES>>	Miss	sing data f	or Channe	l Condition	on field sh	eet. Origin	al Field She	eet: 6-A-S	TR-01 (rewo	ork).	
	N BUFFERS: A	ssess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep	table)		
RIPARIAI Riparian Buffers		mal  3 inches) present, nopy cover and a erstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy covered a	e entire SAR. (roo			h may be accep	NOTES>> Riparian zo upland fore goes throug under Union	ne is st. Stream jh a culvert	
RIPARIAI Riparian Buffers	Optin  Tree stratum (dbh > with > 60% tree canon-maintained und	mal  3 inches) present, nopy cover and a erstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious sourfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	NOTES>> Riparian zo upland fore goes throug under Union	ne is st. Stream jh a culvert	
. RIPARIAI	Optin  Tree stratum (dbh > with > 60% tree canon-maintained und	mal  3 inches) present, nopy cover and a errstory. Wetlands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorium l  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po- High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Riparian zo upland fore goes throug under Union	ne is st. Stream jh a culvert	
Riparian Buffers  Condition Scores  Delineate ripiescriptors. Determine scelow.	Optin  Tree stratum (dbh > with > 60% tree can non-maintained und located within the	ssess both bank mal  3 inches) present, nopy cover and a erestory. Wetlands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are proceedings of the process of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Riparian zo upland fore goes throug under Union	ne is st. Stream jh a culvert	
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow.	Tree stratum (dbh > with > 60% tree canon-maintained und located within the	ssess both bank mal  3 inches) present, nopy cover and a erestory. Wetlands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are proceedings of the process of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr of % Ri	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Riparian zor upland fore goes throug under Union	ne is st. Stream gh a culvert n Camp Dr.	
Riparian Buffers  Condition Scores  Delineate riprescriptors. Determine scelow. Enter the % I	Tree stratum (dbh > with > 60% tree can non-maintained und located within the strain areas along e quare footage for each parain area and strain area and stra	3 inches) present, nopy cover and a terstory. Wetlands riparian areas.  5 beach stream ban ach by measurin Score for each r 100% 1.1	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr of % Ri	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, con olds, con	NOTES>> Riparian zoi upland fore goes throug under Union	ne is st. Stream gh a culvert n Camp Dr.	כו
Riparian Buffers  Condition Scores Delineate ripesescriptors. Determine scelow.	Tree stratum (dbh > with > 60% tree can non-maintained und located within the	ssess both bank mal  3 inches) present, nopy cover and a erestory. Wetlands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr of % Ri	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Riparian zor upland fore goes throug under Union	ne is st. Stream gh a culvert n Camp Dr.	<u>CI</u>
Riparian Buffers  Condition Scores Delineate ripescriptors. Determine scelow. Enter the % I	Tree stratum (dbh > with > 60% tree can non-maintained und located within the strain areas along e quare footage for ea Riparian Area and S Riparian Area Score >	3 inches) present, nopy cover and a eristory. Wetlands riparian areas.  5  5  6  6  7  8  8  8  8  8  8  8  100%  1.1  100%  1.1  ried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	an areas along the ditional Categories and County of the blocks below the blocks below the ditional Categories and County of the categories and County of the categories and County of the blocks below the blocks below the ditional Categories and County of the blocks below the ditional Categories and County of the blocks below the ditional Categories and County of the blocks below the ditional Categories and County of the blocks below the ditional Categories and County of the blocks below the ditional Categories and County of the blocks below the ditional Categories and County of the blocks below the ditional Categories and County of the blocks below the difference of the blocks below the bloc	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, nurseries; conditized, or other comparable condition.  High  0.6  Ensure the Blocks ec	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%	NOTES>> Riparian zoi upland fore goes throug under Union  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	ne is st. Stream gh a culvert n Camp Dr.	
Riparian Buffers  Condition Scores Delineate ripescriptors. Determine scelow. Enter the % I	Tree stratum (dbh > with > 60% tree can non-maintained und located within the located wit	ssess both bank  mal  3 inches) present, nopy cover and a erstory. Wetlands riparian areas.  5  ach stream ban ach by measurin  100%  1.1  100%  1.1  ried substrate siffle poole completers.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu	an areas along the ditional Categoretimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (congth and width. (cong	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided to the condition of the condition	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks ed.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	table)  NOTES>> Riparian zoi upland fore goes throug under Union  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	ne is st. Stream sh a culvert n Camp Dr.  cores*0.01//2 1.10 1.10 a for	
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAI	Tree stratum (dbh > with > 60% tree can non-maintained und located within the located wit	ssess both bank  mal  3 inches) present, nopy cover and a erstory. Wetlands riparian areas.  5  ach stream ban ach by measurin  100%  1.1  100%  1.1  ried substrate siffle poole complete mal  e typically present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below th	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the canopy cover.  All Category  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically 6 of the reach and	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks of the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, dendued surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Riparian zol upland fore goes throug under Union  Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl> NOTES>> Missing dat	ne is st. Stream sh a culvert n Camp Dr.  cores*0.01//2 1.10 1.10 a for	
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine scelow. Enter the % I Right Bank  Left Bank  Instream Habitat/	Tree stratum (dbh > with > 60% tree can non-maintained und located within the discrete discre	ssess both bank  mal  3 inches) present, nopy cover and a erstory. Wetlands riparian areas.  5  ach stream ban ach by measurin  100%  1.1  100%  1.1  ried substrate siffle poole complete mal  e typically present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Categories and Congth and width. Categories and Congth and C	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided at Category  Mar.  Stable habitat ele present in 10-30% are adequate for are dequate for are adequate for a for	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks economic seeds and stabilized of the seeds are seeds and stabilized of the seeds and seeds are seeds and seeds and seeds are seeds and seeds and seeds and seeds are seeds and seeds and seeds and seeds and seeds are seeds and seeds	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%  100%	NOTES>> Riparian zol upland fore goes throug under Union  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>> Missing dat Instream Ha	ne is st. Stream sh a culvert n Camp Dr.  cores*0.01//2 1.10 1.10 a for	

	St	ream Im	npact A	ssessm	ent For	rm Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor	
N/A	csx		VA	R2UB	02070011	09/01/2016	02-STR-78		,	
	L ALTERATION: Stream cross	ings riprap cons						NOTES>>		
	poil piles, constrictions, livestock	ings, riprap, conci			straigntening of ci	nannei, channeilz	auon,	Missing dat	a for	
	Negligible	Mir		al Category Mod	erate	Sev	rere	Channel Alt	teration on	
				40 - 60% of reach	60 - 80% of reach			field sheet.		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any o the channel alterations listed ir the parameter guidelines.	guidelines. II	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/0 shored with ga	10% of reach is y of the channel in the parameter JR 80% of banks bion, riprap, or eent.			
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			
	REACH C	ONDITION IN	NDEX and S	TREAM CO	NDITION UN					
NOTE: The CIs and F	RCI should be rounded to 2 decimal places. T	The CR should be roun	ded to a whole numb	er.				CONDITION INI	` '	
								I= (Sum of all C		0
								I X LF X IF	· , , , , , , , , , , , , , , , , , , ,	
INSERT PHO						Top Right		of stream w of stream to nder roadway		
DESCRIBE F	PROPOSED IMPACT:									

Project/Site: DC2RVA

NC DWQ Stream Identification Form Version 4.11

Date: 09/01/2016

02-STR-78

Date: 09/01/2010	Project/Site. DC		Latitude. 30.38	0023
Evaluator: L. Eggering, L. Postaski	County: Staffor	d	Longitude: -77	.380242
<b>Total Points:</b> 35.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one ermitten Perenni		
A. Geomorphology (Subtotal = 15	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	<u> </u>	2	3
5. Active/relict floodplain	0	<u> </u>	2	3
6. Depositional bars or benches	0	<u> </u>	2	3
7. Recent alluvial deposits	0	<u> </u>	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	11	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes :	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 8		_		
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No	0 = C	Yes :	= 3
C. Biology (Subtotal = 12.5)	_			
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	0	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed			OBL = 1.5 ther = 0	)
*perennial streams may also be identified using other method				
Notes: Sandy bottom stream with small gravel. C	Original Field Sheet	: 6-A-STR-01 (re	ework).	
Sketch:	FOREST	MO Carry De-	CULVERT	
	_ ~ _			

	Ephe	mera		fied Stream N	SSESS Methodology f	or use in Virg		(Fori	m 1a)		
Project #		Project Name	)	Locality	e in ephemeral s Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		DC2RVA		VA	R6	02070011	09/01/2016				
	e(s) of Evalua ering, L. P		Stream Nam	e and Inform	ation	02-61	ΓR-79				
. RIPARIAN	N BUFFERS: A	Assess both bank	•	an areas along the nditional Cate	-	ugh measuremen	ts of length & wid	th may be accept	NOTES>>		
Riparian Buffers	Tree stratum (dbh : with > 60% tree ca non-maintained und are	> 3 inches) present, nopy cover and an derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Nonse herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed y segtated non- maintained area, recently seeded and stabilized, or other comparable condition.	surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		st, channel n a inal Field	
			High	Low	High	maintained understory.	High	Low			
Condition	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
	arian areas along							the sums			
escriptors. . Determine sq elow.	uare footage for e	ach by measurin	g or estimating le	ength and width.	Calculators are pr	ovided for you		Riparian			
	Riparian Area and	Score for each ri	parian category in	n the blocks below	w.		Blocks 6	equal 100			
Right Bank	% Riparian Area>	100% 1.1						100%			
	50010 /								CI= (Sum % RA * S		
Left Bank	% Riparian Area>	100% 1.1						100%	Rt Bank CI >	1.10 1.10	1.1
			ONDITION II	NDEX and S	TREAM COI	NDITION UN	ITS FOR TH	IS REACH			
TE: The CIs and R	RCI should be rounded	to 2 decimal places. T	The CR should be roun	nded to a whole numb	er.				CONDITION IND	• •	0.5
								COMPENSATION	CI= (Riparian CI		0
									X LF X IF	iziti (Oli) >>	
ESCRIBE F	PROPOSED IN	MPACT:				_			_		

Project/Site: DC2RVA

NC DWQ Stream Identification Form Version 4.11

Date: 09/01/2016

02-STR-79

Evaluator: L. Eggering, L. Postaski	County: Staffor		Longitude: -77	.381910
Total Points: 4.5 Stream is at least intermittent		ination (circle one)	Other	
if ≥ 19 or perennial if ≥ 30*	Epnemeral	ermittent Perennial	e.g. Quad Name:	
A. Geomorphology (Subtotal = 0.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	(0)	1	2	3
Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence		1	2	3
4. Particle size of stream substrate	<u>(0)</u>	1	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	6	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	( N	0 = 0	Yes :	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 1 )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes :	= 3
C. Biology (Subtotal = 3				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	2	<b>(</b> 1 <b>)</b>	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish		0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	
*perennial streams may also be identified using other meth		al.		
Notes: Original Field Sheet: 6-A-STR-02 (rewor	k).			
		tion camp of		
Sketch:	Forest Channel	Culve	+	
- 4.	forest of	Culve	11	
A A To	10.00			
Lp nemeral	Channel			
	1	1		
	1	( '		

### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral stre Cowardin Impact **Project Name** HUC SAR# Project # Locality Date Class length Factor N/A DC2RVA - Area 02 ۷A R6 02070011 10/13/2015 1 Stream Name and Information Name(s) of Evaluator(s) 02-STR-80 D. Mitchell, M. Rockwell 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Field Sheet 06-STR-07 Optimal Marginal Suboptimal Poor Low Marginal: High Poor: Law Team 2. Non-maintained, mowed, and maintained areas High Suboptima ow Suboptimal High Marginal: dense herbaceous Low Poor: Riparian areas wit ree stratum (dbh : Riparian areas with ree stratum (dbh > Non-maintained. egetation, ripariar nurseries: no-till Impervious surfaces, mine areas lacking shrub and tree stratum, hay production, cropland; actively grazed pasture, sparsely vegetated non-maintained lense herbaceou Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands vegetation with ther a shrub laye spoil lands, enuded surfaces Riparian tree canopy cove anopy cover and **Buffers** or a tree layer (dbh onds, open wate row crops, active feed lots, trails, or and containing bot maintained nderstory. Rece 3 inches) present If present, tree area, recently herbaceous and with <30% tree canopy cover. other comparable conditions. stratum (dbh >3 seeded and shrub layers or a non-maintained understory. cutover (dense vegetation). abilized, or othe comparable condition. inches) present with <30% tree canopy cover with maintained understory. High Low High Low Hiah Low Condition 0.75 1.2 0.85 0.6

Right Bank 1.2

CI= (Sum % RA \* Scores\*0.01)/2 100% Rt Bank CI > 1.20 CI

1.20 Lt Bank CI > 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors

Determine square footage for each by measuring or estimating length and width. Calculators are provided for you

3. Enter the % Riparian Area and Score for each riparian category in the blocks below

% Riparian Area>

% Riparian Area>

100%

100%

1.2

THE REACH CONDITION INDEX (RCI) >> 0.60 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCLX | F X | F

Ensure the sums

of % Riparian

Blocks equal 100

100%

INSERT PHOTOS:

Scores

Left Bank



Top: Typical views upstream

Bottom: Typical views downstream

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 10/13/2015

02-STR-80

Evaluator: D. Mitchell, M. Rockwell	County: Staffor	d	Longitude: -77	7.385192
<b>Total Points:</b> 16 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) ermittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 9	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	(0)	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	$\bigcirc 0.5$	1	1.5
11. Second or greater order channel	( No	0 = 0	Yes :	= 3
artificial ditches are not rated; see discussions in manual  B. Hydrology (Subtotal = 1)				
12. Presence of Baseflow	0	1	2	3
Iron oxidizing bacteria		1	2	3
14. Leaf litter	1.5	1	0.5	Õ
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?		0 = 0	Yes	
C. Biology (Subtotal = 6)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	<del>  8</del>	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish		0.5	 1	1.5
23. Crayfish		0.5	1	1.5
24. Amphibians		0.5	1	1.5
25. Algae		0.5	1	1.5
			= 1.5 Other = 0	
·	See p. 35 of manua			
26. Wetland plants in streambed *perennial streams may also be identified using other methods Notes: Slight evidence of stream training. Field She Sketch:	·	FACW = 0.75; OB	L = 1.5 Other = 0	

Conditional Category	Project Name  Name(g) of Evaluator(g)  RIPARIAN BUFFERS: Assess both banks 100 four reports are assess are greater and intermination  Conditions  1.5  1.2  1.1  1.0  1.5  1.2  1.1  1.0  1.5  1.1  1.1  1.0  1.5  1.1  1.1	Project # Project Name		∟phe	mera		fied Stream N	/lethodology f	or use in Virg		1 (1 011	m Ta)	
N/A DC2RVA - Area 02 VA R6 02070011 N/A Wight - Area 02070011 N/A Wight - Area 02070011 N/A Wight - Area 02070011 N/A Wigh - Area 02070011 N/A Wight - Area 0207001 N/A	NA DCZRVA - Area 02 VA R6 02070011 N/A 1  Name(s) of Evaluator(s)  Stream Name and Information  O2-STR-81  2. RIPARIAN BUFFERS: Assess from bark 100 for options areas adopting maken 24K. (noigh measurements of segrit, a water may be acceptable).  Conditional Category  Conditional Category  Spatial Subspiritual Subspiritual Sigh Marginal Low Regional Subspiritual Sigh Marginal Subspiritual Subspiritual Sigh Marginal Subspiritual Sub	NA DCZRVA - Area 02 VA R6 02070011 N/A 1 1  Name(s) of Evaluator(s)  Stream Name and Information  O2-STR-81  2. RIPARIAN BUFERS? Assess that busin 150 footnet praise areas around the event SAR (ready measurantment of beingth Avents may be acceptable).  Condition Category  Condition Category  Fig. Business areas along the stream business areas around the event SAR (ready measurantment of beingth Avents may be acceptable).  Riparian Tree straining (this - a lanches) possess in passes are a stream business areas along as the tream business are along the stream business areas along as the tream business are along the stream business are along the stream business are along the stream business areas along as the tream business are along the stream business areas along as the tream business are along the stream business areas along as the tream business are along the stream business areas along as the tream business are along the stream business areas along as the tream business are along the stream business areas along as the tream business are along the stream business areas along as the tream business are along the stream business areas along the stream business are along the stream business are along the stream business are along the stream business areas along the stream business are along the stream business areas along	Project #	ı	Project Name	•		Cowardin		Date	SAR#		
2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal High Suboptimal Riparian areas along the width may be acceptable)  OTES>> Field sheets missing, High Poor: High	Conditional Category   Secretary   Secre	Conditional Category   Continue	N/A	DC	2RVA - Area	02	VA		02070011	N/A		length	
Conditional Category  Optimal Suboptimal Righ Suboptimal Righarian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Righ Suboptimal Righ Suboptimal Righarian areas with tree stratum (dbh > 3 inches) present, with present, with > 60% tree canopy cover and an non-maintained understoy. Wetlands areas.  Riparian areas  Buffers  Riparian areas  anon-maintained understoy. Wetlands areas.  If the braceous and shrub layers or a non-maintained understoy. Wetlands areas.  If the braceous and shrub layers or a non-maintained understoy. Wetlands areas.  If the braceous and shrub layers or a non-maintained understoy. Wetlands areas.  If the braceous and shrub layers or a non-maintained understoy. Wetlands areas.  If the braceous and shrub layers or a non-maintained understoy. Wetlands areas.  If the braceous and shrub layers or a non-maintained understoy. Wetlands areas.  If the braceous and shrub layers or a non-maintained understoy. Wetlands areas.  If the braceous and shrub layers or a non-maintained understoy. Wetlands areas.  If the braceous and shrub layers or a non-maintained understoy. Wetlands areas.  If the braceous and shrub layers or a non-maintained understoy. Wetlands areas.  If the braceous and wetlands areas.  If the braceous and wetlands are and shrub layers or a non-maintained understoy. Wetlands areas.  If the braceous and wetlands areas.  If the braceous and wetlands areas.  If the braceous and wetlands and stream braceous (dense non-maintained understoy).  If the braceous and wetlands areas.  If the braceous and wetlands areas.  If the stream braceous (dense non-maintained understoy).  If the braceous and wetlands areas.  If the braceou	Condition   1.5   1.2   1.1   0.85   0.75   0.6   0.5    Berlinan foreign affect and some size of the south records and source for seal Not treated to a return record of the south records and source for seal Not treated to a return record of the south records and source for seal Not treated to a return record of the south records and source for seal Not treated to a return record of the south records and source for seal Not treated to a return record of the south records and source for seal Not treated to a return record of the south records and source for seal Not treated to a return record of the south records and source for seal Not treated to a return record of the south records and source for seal not treated and source for seal not	Condition   1.5   1.2   1.1   0.85   0.75   0.8   0.5    Berlinde provided representation of the provided representation of the provided for your clearly of the prov	Name	e(s) of Evaluat	tor(s)	Stream Nam	e and Informa	ation					
Conditional Category	Copinional   Suboptimal   Marginal   Poor   Field sheets missing, find material   Field sheets missing,	Conditional Category  With State of the Condit							02-S	ΓR-81			
Condition   Scores   1.5   1.2   1.1   0.85   0.75   0.6   0.5   0.6   0.5	Riparian Buffers    Condition   1.5   1.2   1.1   0.85   0.75   0.6   0.5	Condition   Too claim (dis > 3 look operated   September   Septe	2. RIPARIAN	N BUFFERS: A	ssess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	th may be accept	table)	
Riparian areas with tree stratum (dbh > 3 inches) present, with 3 inches) present, with 3 inches) present, with 5 3 inches	Riparian Buffers  Riparian Buffers  Riparian Surface and Score 1 1.5  1.2  1.1  1.0 store with year and year an	Riparian Buffers  Riparian Buf		Onti	1			<del> </del>	-11	l n			mississ
Condition Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the lescriptors.  Deltermine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  Bight Bank  Right Bank  Right Bank  Riparian Area 100%  Score > 1.2  CI= (Sum % RA * Scores*0.01)/2  CI= (Sum % RA * Scores*0.01)/2  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores 1.5 Delineate reparant areas along each stream bank into Condition Categories and Condition Scores using the scoreptors.  Secretary and the secretary of the Secret	Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Delineate reparam areas acting packs attream bank into Condition Categories and Condition Scores using the scoreptors.  Secretary and the secretary of the Spariam Areas and Score for each pyrineau category in the blocks below.  Ender the % Ripstan Areas and Score for each reparation category in the blocks below.  Ender the % Ripstan Areas and Score for each reparation category in the blocks below.  Ender the % Ripstan Areas and Score for each reparation category in the blocks below.  Ender the % Ripstan Areas and Score for each reparation category in the blocks below.  Ender the % Ripstan Areas and Score for each reparation category in the blocks below.  Ender the % Ripstan Areas and Score for each reparation category in the blocks below.  Ender the % Ripstan Areas and Score for each reparation category in the blocks below.  Ender the % Ripstan Areas and Score for each reparation category in the blocks below.  Ender the % Ripstan Areas and Score for each reparation category in the blocks below.  Ender the % Ripstan Areas and Score for each reparation category in the blocks below.  Ender the search of % Ripstan Areas and Score for each reparation category in the blocks below.  Ender the search of % Ripstan Areas and Score for each reparation category in the blocks below.  Ender the search of % Ripstan Areas and Score for each reparation in the search of % Ripstan Category in the blocks below.  Ender the search of % Ripstan Areas and Score for the search of % Ripstan Category in the blocks below.  Ender the search of % Ripstan Areas and Score for each reparation and provided in the search of % Ripstan Areas and Score for the search of % Ripstan Areas and Score for the search of % Ripstan Areas and Score for the search of % Ripstan Areas and Score for the search of % Ripstan Areas and Score for the search of % Ripstan Areas and Score for the search of the search of % Ripstan Areas and Score for the search of % Ripstan Areas and Score for the search of % Ripstan Areas and Sco		Tree stratum (dbh > with > 60% tree car	> 3 inches) present, nopy cover and an derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Low Marginat: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces row crops, active feed lots, trails, or other comparable	information from aerials nearby field	filled out and
Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the lescriptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  Right Bank  Right Bank  Riparian Area 100%  Score > 1.2  Cl= (Sum % RA * Scores*0.01)/2  Cl= (Sum % RA * Scores*0.01)/2  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	Comparison   Com	Scores 1-5 1.2 1.2 1.2 5.0 5.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	Condition			High	Low	High		High	Low		
Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the lescriptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you selow.  Bicket the % Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100  Cl= (Sum % RA * Scores*0.01)/2  Cl= (Sum % RA * Scores*0.01)/2  Left Bank  KRiparian Area> 100% Score > 1.2  Cl= (Sum % RA * Scores*0.01)/2  Left Bank  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	Delineate figarian areas along each stream bank in Condition Categories and Conditions Scores using the Secreptors.	Delineate figarian areas along each stream bank in Condition Categories and Conditions Scores using the Secreptors.		1.	5	1.2	1.1	0.85	0.75	0.6	0.5		
Compensation Requires the Cis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.   CR = RCI x LF x IF	2. Determine square footage for each by measuring regetly and width. Calculators are provided for you provided.  3. Enter the % Righarian Area and Score for each figurian category in the blocks below.  8. Right Bank	2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  8. Enter the \$K. Ripartian Areas and Score for each spartian category in the blocks below.  8. Enter the \$K. Ripartian Areas and Score for each spartian category in the blocks below.  8. Enter the \$K. Ripartian Areas and Score for each spartian category in the blocks below.  8. Enter the \$K. Ripartian Areas and Score for each spartian category in the blocks below.  8. Enter the \$K. Ripartian Areas and Score for each spartian category in the blocks below.  8. Enter the \$K. Ripartian Areas and Score for each spartian category in the blocks below.  8. Enter the \$K. Ripartian Areas and Score for each spartian category in the blocks below.  8. Enter the \$K. Ripartian Areas and Score for each spartian category in the blocks below.  8. Enter the \$K. Ripartian Areas and Score for each spartial category in the blocks below.  8. Enter the \$K. Ripartian Areas and Score for each spartial category in the blocks below.  8. Enter the \$K. Ripartian Areas and Score for each spartial category in the blocks below.  8. Enter the \$K. Ripartian Areas and Score for each spartial category in the blocks below.  8. Enter the \$K. Ripartian Areas and Score for each spartial category in the blocks below.  8. Enter the \$K. Ripartian Areas and \$K. Ripartian Area	<ol> <li>Delineate ripa</li> </ol>	arian areas along e	each stream ban	k into Condition C	Categories and Co	ondition Scores us	sing the	Ensure	the sums		
Right Bank	Right Bank % Right Rank % Right	Right Bank % Right Rank % Right	<ol> <li>Determine sq</li> </ol>	uare footage for e	ach by measurin	g or estimating le	ngth and width. (	Calculators are pr	ovided for you	of % F	Riparian		
Right Bank   Score >   1.2   Cl= (Sum % RA * Scores*0.01)/2	Right Bank   Score > 1.2   Class Na RA* Scores*(0.01)2.  Left Bank   Score > 1.2   Class Na RA* Scores*(0.01)2.  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  OTE: The Classed RCI about the rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >> RCI= (Ripartin CI)/2  COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  NSERT PHOTOS:	Right Bank Score 1.2 Cole (Sum % RA* Score*) 01/92.  Left Bank Score 1.2 Cole (Sum % RA* Score*) 01/92.  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  OTE: The Clis and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCl) >> COMPENSATION REQUIREMENT (CR) >> CR = RCl X LF X IF  NSERT PHOTOS:		Riparian Area and	Score for each ri	parian category in	n the blocks below	w.		Blocks e	qual 100		
Cl= (Sum % RA * Scores*0.01)/2   Left Bank   % Riparian Area > 100%   Rt Bank Cl > 1.20     Score > 1.2   Lt Bank Cl > 1.20     REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH   OTE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.   THE REACH CONDITION INDEX (RCl) >>     RCl= (Riparian Cl)/2     COMPENSATION REQUIREMENT (CR) >>     CR = RCl X LF X IF	Left Bank    Secondary   1.2	Left Bank    Secondary   1.00%   R. Bank Cl >   1.20	Right Bank								100%	_	
Score > 1.2 Lt Bank CI > 1.20  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  FOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >> RCI- (Riparian Ci)/2  COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  NSERT PHOTOS:	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >> RCI- (Riparian Ci)/2  COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  NSERT PHOTOS:		Score >	1.2							CI= (Sum % RA * So	ores*0.01)/2
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  OTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  OTE: The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCIe (Riperian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  NSERT PHOTOS:	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  OTE: The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCIe (Riperian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  NSERT PHOTOS:	Left Bank								100%		
THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  SEET PHOTOS:	THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  SEET PHOTOS:		Score >							10 554 611	Lt Bank CI >	1.20
RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI x LF x IF  SERT PHOTOS:	RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI x LF x IF  SERT PHOTOS:			REACH C	ondition II	NDEX and S	TREAM COL			IS DEVUE		
CR = RCI X LF X IF	CR = RCI X LF X IF  SERT PHOTOS:	CR = RCI X LF X IF  SERT PHOTOS:	OTE: The Cle and D	Cl should be rounded t	o 2 desimal places.	The CB should be roun	adad to a whole numb		NDITION ON	IIS FOR IN		CONDITION IND	EV (BCI) >>
	SERT PHOTOS:	SERT PHOTOS:	OTE: The CIs and R	CI should be rounded	to 2 decimal places.	The CR should be roun	nded to a whole number		ADITION ON	IIS FOR IN	THE REACH (		
	PESCRIBE PROPOSED IMPACT:	DESCRIBE PROPOSED IMPACT:			to 2 decimal places.	The CR should be roun	nded to a whole numb		NOTITION ON		THE REACH ( R COMPENSATI	CI= (Riparian CI).	/2

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date:

02-STR-81

<b>County:</b> Stafford <b>Longitude:</b> -77.385056
phemeral ntermittent Perennial Other e.g. Quad Name:
Absent Weak Moderate Strong
0 1 2 3
0 1 2 3
0 1 2 3
0 1 2 3
0 1 2 3
0 1 2 3
0 1 2 3
0 1 2 3
0 0.5 1 1.5
0 0.5 1 1.5
No = 0 Yes = 3
·
0 1 2 3
0 1 2 3
1.5 1 0.5 0
0 0.5 1 1.5
0 0.5 1 1.5
No = 0 Yes = 3
-
3 2 1 0
3 2 1 0
0 1 2 3
0 1 2 3
0 0.5 1 1.5
0 0.5 1 1.5
0 0.5 1 1.5
0 0.5 1 1.5
FACW = 0.75; OBL = 1.5 Other = 0
ee p. 35 of manual.
d sheets).
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		Stre					ı (Fori	m 1)			
				fied Stream N wadeable chan							
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	02	VA	R2SB	02070011	10/13/2015				
	e(s) of Evaluat		Stream Nam	e and Informa	ation						
	chell, M. Roc					02-S	TR-82				
. Channel C	ondition: Asse			C	Conditional Catego	ry					
	Optio	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	rere	
	1	JANA .	Slightly incised, for	ew areas of active	Poor. Banks more	less than Severe or stable than Severe	Overwidene Vertically/laterally u	ınstable. Likely to	Deeply incised	(or excavated),	
Channel Condition	Very little incision or 100% stable ban surface protection prominent (80-10 Stable point bars/b are present. Acces floodplain or fully bankfull benches. I	iks. Vegetative or natural rock, 00%). AND/OR bankfull benches as to their original developed wide Mid-channel bars,	of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, d floodplains along	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Major are near vertical. E 60-80% of banl protection preset banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib	rosion present on is. Vegetative it on 20-40% of ficient to prevent 60-80% of the d by sediment. prary/transient in uting to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, n vertical/underc protection present of banks, is not pre	stability. Severe tatained within the ed below average najority of banks sut. Vegetative on less than 20% of eventing erosion. Dughing present.	
	and transverse bar sediment deposition 10% of b	covers less than	sediment cover	reach. Transient rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the onal features which to stability.	AND/OR V-shape vegetative protection 40% of the barn sediment depos	on is present on > ks and stable	AND/OR Aggradin	g channel. Greater in bed is covered by outing to instability. channels and/or	С
Score	3		2	.4		2	1.	6	1	ı	2.4
				Field	Shoot Of-	STR-08 Tea	am 2				
NOTES>>	I BIJEEERS: A	seess both bank	de 100 foot ringris					h may ba accor	table)		
	N BUFFERS: A	ssess both bank			e entire SAR. (ro			h may be accep	table)		
	N BUFFERS: A		Con	an areas along the	e entire SAR. (ro	ugh measuremen					
		mal  3 inches) present, nopy cover and a erstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy covered a	e entire SAR. (ro	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	ts of length & widt		NOTES>>		
. RIPARIAN	Option  Tree stratum (dbh > with > 60% tree canon-maintained und	mal  3 inches) present, nopy cover and a erstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>>		
. RIPARIAN	Option  Tree stratum (dbh > with > 60% tree canon-maintained und	mal  3 inches) present, nopy cover and a erestory. Weltands riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active fee lots, trails, eor other comparable conditions.	NOTES>>		
Riparian Buffers  Condition Scores  Delineate ripalescriptors. Determine sceletow.	Optia  Tree stratum (dbh > with > 60% tree ca. non-maintained und located within the	3 inches) present, nopy cover and a enstory. Wetlands riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	an areas along the ditional Categories and Congth and width. Categories and Categ	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a>30%</a> tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>		
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % F	Tree stratum (dbh > with > 60% tree cai non-maintained und located within the	3 inches) present, nopy cover and a erestory. Weltands or riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	an areas along the ditional Categories and Congth and width. Categories and Categ	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a>30%</a> tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>		
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Riparian Buffers  Condition Scores  Delineate rips escriptors. Determine scelow. Enter the % F	Tree stratum (dbh > with > 60% tree cai non-maintained und located within the	3 inches) present, nopy cover and a erestory. Weltands or riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	an areas along the ditional Categories and Congth and width. Categories and Categ	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a>30%</a> tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>	cores*0.01)/2	Ci
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % F	Tree stratum (dbh > with > 60% tree can non-maintained und located within the located l	3 inches) present, nopy cover and a restory. Wetlands riparian areas.  5 beach stream ban ach by measurin Score for each ri 100% 1.2	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	an areas along the ditional Categories and Congth and width. Categories and Categ	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a>30%</a> tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%	NOTES>>		<u>CI</u>
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % f Right Bank  Left Bank  B. INSTREAL	Tree stratum (dbh > with > 60% tree can on-maintained und located within the located with	3 inches) present, nopy cover and a restory. Wetlands riparian areas.  5  ach stream ban ach by measurin 100% 1.2  100% 1.2  ried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Con the blocks below	Be entire SAR. (rogory  Mar  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prove	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-fill cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	1.20	
Riparian Buffers  Condition Scores  Delineate ripr lescriptors. Determine sceletow. Enter the % If Right Bank  Left Bank  INSTREAL	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located l	3 inches) present, nopy cover and a erstory. Wetlands riparian areas.  5 each stream ban ach by measurin 100% 1.2 100% 1.2 ried substrate siffle poole complete the complete stream of	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu	an areas along the ditional Categoriem al Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Coungth and width. Coungth and width. Coungth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <20% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tf  of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.20	
Condition Scores  Delineate rips lescriptors. Determine scelow. Enter the % f Right Bank  Left Bank  Instream Habitat/	Tree stratum (dbh > with > 60% tree can non-maintained und located within the located wit	3 inches) present, nopy cover and a restory. Wetlands riparian areas.  5 beach stream ban and by measuring 100% 1.2 100% 1.2 ried substrate siffle poole comples mal	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Con the blocks below ty and depths; wo res.  Conditional primal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ed  Blocks ed  Attack of the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Les sums parian qual 100  100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.20	
Riparian Buffers  Condition Scores  Delineate ripe lescriptors. Determine scelow. Enter the % f Right Bank  Left Bank  Instream	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located l	3 inches) present, nopy cover and a erstory. Wetlands riparian areas.  5 ach stream ban ach by measurin 100% 1.2 100% 1.2 ried substrate siffle poole complete the poole complete typically present the poole complete the poo	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Categoriem al Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. Congth and width. Congth and depths; wo res. Conditionaptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory. Low  0.75  Sing the ovided for you  pris; stable substr	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >  NOTES>>	1.20	

	St	ream In	npact A	ssessm	ent For	m Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2SB	02070011	10/13/2015	02-STR-82			
4. CHANNEL	L ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of ch	hannel, channeliz	ation,	NOTES>>		
embankments, s	poil piles, constrictions, livestock		Conditiona							
	Negligible	Mi	nor		erate	Sev	ere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		of the channel in the parameter PR 80% of banks bion, riprap, or			
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5			1.50
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			
NOTE: The CIs and R	RCI should be rounded to 2 decimal places. T	he CR should be roun	ded to a whole numb	er.				CONDITION IN		
								I= (Sum of all C ON REQUIRE		0
						· ·		I X LF X IF	ILITI (OK) >>	U
INSERT PHO	OTOS:									
DESCRIBE F	PROPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11

02-STR-82

Date: 10/13/2015	Project/Site: DC2RVA - Area 02	Latitde: 38.386522
Evaluator: D. Mitchell, M. Rockwell	County: Stafford	Longitude: -77.386534
<b>Total Points:</b> 20.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 5.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	(0)	Y	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	T)	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	7	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
a artificial ditches are not rated; see discussions in manual			•	
B. Hydrology (Subtotal = 6.5)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5		1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
C. Biology (Subtotal = $8.25$	<b>'</b>			
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	Y	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = $0.75$ ;	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other method	ls. See p. 35 of manua	l.		
Notes: Seep located at 38.386403, -77.386475; st	tream originates fr	om seep. Field	Sheet 06-STR-09 T	eam 2.
Sketch: SeeP W	exland			Perennia

N/A DC2R  Name(s) of Evaluator( L. Eggering, R. Mang 1. Channel Condition: Assess th  Optima  Very little incision or active to the condition of the condition	ngum s the cross-sect  nal  active erosion; 80- //egetative surface rock, prominent RS Stable point ness are present, nal floodplain or bankfull benches. d transverse bars ment deposition	DC2RVA - Ar  s) of Evaluator(s)  ring, R. Mangum  dition: Assess the cross-s  Optimal  Optimal  Optimal  Optimal  All (80-100%). AND/OR Stable poin bars/bankfull benches are presen cleaned by the control of the contr	Stream Nam  Subce  Sightly incised, erosion or unprote of banks are expensive protein prominent (6 Depositional feas stability. The bechannels are well of has access to be newly develope portions of the sediment covers 1		often incised, but I Poor. Banks more or Poor due to lo Erosion may be preboth banks. Vegetat 60% of branks. Severtical or unde 60% of stream is cc Sediment may be to contribute instability contribute to st	Brindermittent or process intermittent or process than Severe or stable than Severe wer bank slopes. Sesent on 40-60% of treambanks may rout. AND/OR 40-overed by sediment. emporary/transient, ty. Deposition that	Poerennial Date  08/11/2016  TR-83  Po  Overwiden Vertically/laterally widen further. Maj are near further. Maj insufficient to prever	ad/incised. unstable. Likely to prity of both banks usion present on 60- getative protection 6 of banks, and is	Deeply incised vertical/lateral in incision, flow cor	Impact Factor			
N/A DC2R  Name(s) of Evaluator( L. Eggering, R. Mang Channel Condition: Assess th  Optima  Very little incision or activation of the condition	pr(s) ngum s the cross-sect nal active erosion; 80- /egetative surface rock, prominent RS Stable point ness are present. alf floodplain or bankfull benches. d transverse bars ment deposition	DC2RVA - Ar  s) of Evaluator(s)  ring, R. Mangum  dition: Assess the cross-s  Optimal  Optimal  Optimal  Optimal  All (80-100%). AND/OR Stable poin bars/bankfull benches are presen cleaned by the control of the contr	Stream Nam  Subc  Slightly incised, erosion or unprote of banks are vegetative prote prominent (60 Depositional fea stability. The be channels are well thas access to be newly develope portions of the sediment covers 1	Locality  VA  The and Informa  and prevailing conceptimal  few areas of active acted banks. Majority stable (60-80%). Cition or natural rock 0-80%) AND/OR atures contribute to ankfull and low flow defined. Stream likely ankfull benches, or d floodplains along reach. Transient 10-40% of the stream	Cowardin Class.  R2SB  tion  dition (erosion, agg. conditional Categor Marg. Marg. Conditional Categor Marg. Company to the control of the company to the control of the co	HUC  02070011  02-S7  gradation)  y  ginal  ess than Severe or stable than Severe wer bank slopes. essent on 40-60% of treambanks may rout. AND/OR 40-vvered by sediment. emporary/transient, ty. Deposition that	Po  Overwiden Vertically/laterally widen further. Maj are near vertical. Er 80% of banks. Veg present on 20-409 insufficient to prever	ed/incised. unstable. Likely to ority of both banks osion present on 60- getative protection 6 of banks, and is	Sev  Deeply incised vertical/lateral in incision, flow cor	Factor			
Channel Condition: Assess the Optimal Condition    Condition    Score	ngum s the cross-sect  nal  active erosion; 80- //egetative surface rock, prominent RS Stable point ness are present, nal floodplain or bankfull benches. d transverse bars ment deposition	optimal  ory little incision or active erosion; objection or natural rock, promine control of the control of th	Stream Nam  on of the stream  Subc  Slightly incised, erosion or unprote of banks are : Vegetative prote prominent (60 Depositional fea stability. The bachannels are well of has access to binewly develope portions of the sediment covers 1	and prevailing conceptimal  few areas of active stable (60-80%). cition or natural rock 0-80%) AND/OR atures contribute to ankfull and low flow defined. Stream likely ankfull benches, or d floodplains along reach. Transient 10-40% of the stream	Often incised, but I Poor. Banks more or Poor due to lo Erosion may be proboth banks. Vegetat 60% of branks. Sewertical or unde 60% of stream is cc Sediment may be tontribute instabilitic contribute to st	gradation)  y ginal  ess than Severe or stable than Severe wer bank slopes. seent on 40-60% of treambanks may rout. AND/OR 40- vered by sediment. emporary/transient, ty. Deposition that	Po  Overwidem  Vertically/laterally widen further. Maja are near vertical. Ers 80% of banks. Veg present on 20-409 insufficient to prever	ad/incised. unstable. Likely to prity of both banks usion present on 60- getative protection 6 of banks, and is	Deeply incised vertical/lateral in incision, flow cor	5			
Channel Condition: Assess the Optima  Channel Condition: Assess the Optima Occident of Progression of Assess the Optima Occident of Progression of Assess to their original fully developed wide bank of the Access to their original fully developed wide bank of the Access to their original fully developed wide bank of the Access to their original fully developed wide bank of the Access to their original fully developed wide bank of the Access to their original fully developed wide bank of the Access to their original fully developed wide bank of the Access to their original fully developed wide bank of the Access to their original fully developed wide bank of the Access to their original fully developed wide bank of the Access to their original fully developed wide bank of the Access to their original fully developed with the few Transient sediment of the Access to their original fully developed with the few Transient sediment of the Access to their original fully developed with the few Transient sediment of the Access to their original fully developed with the few Transient sediment of the Access to their original fully developed with the few Transient sediment of the Access to their original fully developed with the few Transient sediment of the Access to their original fully developed wide bank or their original fully developed with the few Transient sediment of the Access to their original fully developed with the few Transient sediment of the Access to their original fully developed with the few Transient sediment of the Access to their original fully developed with the few Transient sediment of the Access to their original fully developed with the few Transient sediment of the Access to their original fully developed with the few Transient sediment of the Access to their original fully developed with the few Transient sediment of the Access to their original fully developed with the few Transient sediment of the Access to their original fully developed with the few Transient sediment of the Access to their o	ngum s the cross-sect  mal  active erosion; 80- /egetative surface rock, prominent RS Stable point ness are present. nal floodplain or bankfull benches. d transverse bars ment deposition	optimal  Optimal  Optimal  Optimal  Oy little incision or active erosion; 0% stable banks. Vegetative surfortection or natural rock, promine (80-100%). AND/OR Stable poin bars/bankfull benches are presen ly developed wide bankfull bench id-channel bars, and transverse b few. Transient sediment depositio covers less than 10% of bottom.	Slightly incised, erosion or unprote of banks are : Vegetative prote prominent (6 Depositional fea stability. The bachannels are well of has access to be newly develope protions of the sediment covers 1	few areas of active ected banks. Majority stable (60-80%). cttion or natural rock 0-80%) AND/OR atures contribute to ankfull and low flow defined. Stream likely ankfull bank or ankfull and 10-40% of the stream	Often incised, but I Poor. Banks more or Poor due to lo Erosion may be proboth banks. Vegeta 60% of banks. Severtical or unde 60% of stream is oc Sediment may be to contribute instabilitic contribute to st	gradation)  y  ginal  ess than Severe or stable than Severe wer bank slopes. esent on 40-60% of ive protection on 40- treambanks may rout. AND/OR 40- overed by sediment. emporary/transient, ty. Deposition that	Po Overwiden Vertically/laterally widen further. Maj are near vertical. Er 80% of banks. Veg present on 20-40% insufficient to prever	ad/incised. unstable. Likely to prity of both banks usion present on 60- getative protection 6 of banks, and is	Deeply incised vertical/lateral in incision, flow cor	5			
Channel Condition: Assess the Optima  Channel Condition  Channel Condition  Very little incision or active condition of the c	active erosion; 80- degetative surface rock, prominent PR Stable point ness are present. and floodplain or bankfull benches. d transverse bars ment deposition	Optimal  Opt	Slightly incised, erosion or unprote of banks are : Vegetative prote prominent (6( Depositional fea stability. The bachannels are well of has access to be newly develope portions of the sediment covers 1	few areas of active stable (60-80%). cttion or natural rock 0-80%). dttion or natural rock 0-80%) AND/OR atures contribute to ankfull and low flow defined. Stream likely ankfull benches, or d floodplains along reach. Transient 10-40% of the stream	Often incised, but I Poor. Banks more or Poor due to lo Erosion may be proboth banks. Vegetat 60% of branks. Severtical or unde 60% of stream is cc Sediment may be t contribute instabili contribute to st	gradation)  y  ginal  ess than Severe or stable than Severe wer bank slopes. esent on 40-60% of ive protection on 40-treambanks may rout. AND/OR 40-overed by sediment. emporary/transient, beposition that	Po Overwiden Vertically/laterally widen further. Maj are near vertical. Er 80% of banks. Veg present on 20-40% insufficient to prever	ad/incised. unstable. Likely to prity of both banks usion present on 60- getative protection 6 of banks, and is	Deeply incised vertical/lateral in incision, flow cor	5			
Channel Condition  Channel Condition  Very little incision or activation of activation or natural roc (80-100%). AND/OR bars/bankfull benches Access to their original fully developed wide bar Mid-channel bars, and triew. Transient sedimer covers less than 10%  Score  3  NOTES>>  RIPARIAN BUFFERS: Asses  Optimal  Tree stratum (dbh > 3 in with > 60% tree canopy non-maintained underst located within the rips of the control of	nal  active erosion; 80- fegetative surface rock, prominent RS Stable point nes are present. nal floodplain or bankfull benches. d transverse bars ment deposition	Optimal  In little incision or active erosion; 0% stable banks. Vegetative surfortection or natural rock, promine (80-100%). AND/OR Stable poin bars/bankfull benches are presen access to their original floodplain. Ity developed wide bankfull benchid-channel bars, and transverse bew. Transient sediment depositio covers less than 10% of bottom.	Slightly incised, erosion or unprote of banks are : Vegetative prote prominent (6( Depositional fea stability. The bachannels are well of has access to be newly develope portions of the sediment covers 1	few areas of active stable (60-80%). cttion or natural rock 0-80%). dttion or natural rock 0-80%) AND/OR atures contribute to ankfull and low flow defined. Stream likely ankfull benches, or d floodplains along reach. Transient 10-40% of the stream	Often incised, but I Poor. Banks more or Poor due to lo Erosion may be proboth banks. Vegetat 60% of branks. Severtical or unde 60% of stream is cc Sediment may be t contribute instabili contribute to st	ess than Severe or stable than Severe wer bank slopes. seent on 40-60% of treambanks may rout. AND/OR 40-vvered by sediment. emporary/transient, ty. Deposition that	Overwiden Vertically/laterally widen further. Maj are near vertical. Er 80% of banks. Veg present on 20-40% insufficient to prever	ad/incised. unstable. Likely to prity of both banks usion present on 60- getative protection 6 of banks, and is	Deeply incised vertical/lateral in incision, flow cor	5			
Channel Condition  Very little incision or activity of the condition of th	active erosion; 80- /egetative surface rock, promierok PR Stable point les are present. and floodplain or bankfull benches. d transverse bars ment deposition	ry little incision or active erosion; 0% stable banks. Vegetative surfortection or natural rock, promine (80-100%). AND/OR Stable poin bars/bankfull benches are presen cocess to their original floodplain. Illy developed wide bankfull benchid-channel bars, and transverse b rew. Transient sediment depositio covers less than 10% of bottom.	Slightly incised, erosion or unprote of banks are vegetative prote-prominent (60 Depositional fee stability. The bechannels are well of has access to be newly developer portions of the sediment covers 1	few areas of active steed banks. Majority stable (60-80%). ction or natural rock 0-80%) AND/OR atures contribute to ankfull and low flow defined. Stream likely ankfull benches, or d floodplains along reach. Transient 10-40% of the stream	Often incised, but I Poor. Banks more or Poor due to lo Erosion may be proboth banks. Vegetat 60% of banks. S bevertical or unde 60% of stream is co. Sediment may be toontribute instabilis contribute to st	ess than Severe or stable than Severe wer bank slopes. seent on 40-60% of ive protection on 40- treambanks may rout. AND/OR 40- overed by sediment. emporary/transient, ty. Deposition that	Overwiden Vertically/laterally widen further. Maj are near vertical. Er 80% of banks. Veg present on 20-40% insufficient to prever	ad/incised. unstable. Likely to prity of both banks usion present on 60- getative protection 6 of banks, and is	Deeply incised vertical/lateral in incision, flow cor	5			
Condition  100% stable banks. Veg protection or natural roc (80-100%). AND/OR bars/bankfull benches Access to their original fully developed wide bar Mid-channel bars, and treme covers less than 10%.  Score  3  NOTES>>  Condition Buffers  Tree stratum (dbh > 3 in with > 60% tree canopy non-maintained underst located within the rips of the control of	/egetative surface rock, prominent DR Stable point nes are present. nal floodplain or bankfull benches. d transverse bars ment deposition	ops stable banks. Vegetative surfotection or natural rock, promine (80-100%). AND/OR Stable poin bars/bankfull benches are presen Access to their original floodplain. Illy developed wide bankfull benchid-channel bars, and transverse bew. Transient sediment depositio covers less than 10% of bottom.	erosion or unprote of banks are: vegetative prote prominent (60 Depositional feastability. The bachannels are well a has access to be newly developer portions of the sediment covers 1	ected banks. Majority stable (60-80%) ction or natural rock 0-80%) AND/OR atures contribute to ankfull and low flow defined. Stream likely ankfull benches, or d floodplains along reach. Transient 10-40% of the stream	Poor. Banks more or Poor due to lo Erosion may be proboth banks. Vegetatl 60% of banks. S bevertical or unde 60% of stream is cc Sediment may be t contribute instabilic contribute to st	stable than Severe wer bank slopes. essent on 40-60% of rive protection on 40-treambanks may rout. AND/OR 40-wered by sediment. emporary/transient, ty. Deposition that	Vertically/laterally widen further. Maji are near vertical. En 80% of banks. Veg present on 20-40% insufficient to prever	unstable. Likely to prity of both banks osion present on 60- getative protection 6 of banks, and is	vertical/lateral in incision, flow cor	(or excavated)			
Riparian Buffers  Tree stratum (dbh > 3 in with > 60% tree canopy non-maintained underste located within the rips  Condition Scores  1.5  Delineate riparian areas along each so the content of the conte		3			channels have vege	AND/OR V-shaped etative protection on	sediment. S temporary/transie contributing to insta shaped channels protection is preser	nt in nature, and bility. AND/OR V- have vegetative nt on > 40% of the	rooting depth, rr vertical/undercut. V present on less tha not preventing eros sloughing present. on 80-100%. ANI channel. Greater t bed is covered contributing to in	stability. Severe tatained within the ad below average najority of banks egetative protection a 20% of banks, is sion. Obvious bank Erosion/raw banks D/OR Aggrading han 80% of stream I by deposition, stability. Multiple			
Riparian Buffers  Condition Scores  Delineate riparian areas along each so better the % Riparian Area and Score		bott			> 40% of the bank features which cor	tribute to stability.	banks and stable sed abse	ent.	flo		CI		
Condition Scores  Delineate riparian areas along each and the riparian areas along each and the riparian areas and Scores  Enter the % Riparian Area and Scores			2	2.4	2	2	1.	6	1	1	2.4		
with 5 60% tree canopy non-maintained underst located within the rips  Condition Scores  Delineate riparian areas along each to be the riparian areas along each to be the riparian areas and Scores.  Enter the % Riparian Area and Score	nal	Optimal		nditional Cate		ginal	Po		NOTES>>The decending bat upland forest	ank is			
Scores  1.5  Delineate riparian areas along each second control of the second control of	opy cover and a erstory. Wetlands	ree stratum (dbh > 3 inches) prese with > 60% tree canopy cover and non-maintained understory. Wetlar located within the riparian areas.	High Suboptimal Riparian areas with tree stratum (dbh : 3 inches) present, with 30% to 60% tree canopy cover and containing bot herbaceous and shrub layers or a non-maintained understory.	h Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.					
. Delineate riparian areas along each so . Determine square footage for each b . Enter the % Riparian Area and Score			High	Low	High	Low	High	Low					
Determine square footage for each b	i	1.5	1.2	1.1	0.85	0.75	0.6	0.5					
	h by measuring	e footage for each by measur	or estimating len	gth and width. Calo	ŭ	·	Ensure the sums of % Riparian Blocks equal 100						
// Nipallall Area>	70%		30%				2.ooko ek	100%					
Right Bank Score >	1.2		1.1										
% Riparian Area>		Riparian Area>	10%					100%	CI= (Sum % RA * Si	cores*0.01)/2	CI		
Left Bank Score >	90%		1.2					100 /0	Lt Bank CI >	1.47	1.32		
	90%			and depths: woody	and leafy debris:	stable substrate: I	ow embededness:	shade; undercut					
	1.5					,			bottom is pri				
Instroam	1.5 ed substrate siz	Ontimal	Subo		al Category	ginal	Po	or					
Habitat/ Available Habitat elements are type	1.5 ed substrate siz emplexes, stable	M HABITAT: Varied substrate sizes, w ; SAV; riffle poole complexes, stable feat Optimal		Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of adequate		ements are typically of the reach and are	Stable habitat eler	ments are typically of the reach and are naintenance of	ch and are lacking or are unstable. Habitat				
Score 1.5	1.5 ed substrate siz emplexes, stable nal	abitat elements are typically presi in greater than 50% of the reach	<del>                                     </del>	1.2	0	.9	0.	5		-	1.20		

N/A   CSX   VA   R2SB   02070011   08/11/2016   02-STR-83   500   1	Project if Appellorers Locally Convents Class. HILD Disa Point SAR tength Impact Factor NA CSX VA R2SB 02070011 005112016 02-STR-83 5000 1  4. CHANNEL ALTERATIONS: treatment ceargin, figure, concess, guidence of concesses blocks, small belief to grant and concess. Newsicot.    Negligible   Minimum   Minim	Project # Applicant Locality Cowardin Class. HUC Date Data Point SAR length Impact Factor  N/A CSX VA R2SB 02070011 08/11/2016 02-STR-83 500 1  4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock    Channel Alteration   Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. In the parameter guidelines.   Possible of the parameter guideline		S	tream Ir	npact A	ssessm	nent For	m Page	2		
A. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock    Channel Alteration   Negligible   Minor   Moderate   Severe   Moderate   Moderate   Severe   Moderate   Moderate   Moderate   Severe   Moderate    A CHANNEL ALTERATION: Stream crossrage, repnip, concrete, gubones, or concerning bissess, straigntnessing of external, charanterization, amenantements.  Negligible  Nogligible  Nogligibl	A CHANNEL ALTERATION: Similar crossroys, repop, excerning, glaces, or concreting blacks, straightening of channels.  Negligible  Nor  Channel  Alteration  Channel  Channel  Alteration  Channel  Channel  Alteration  Channel  Channel  Alteration  Channel   Project #								SAR length	Impact Factor		
Channel Alteration  Channel Alteration  Channel Channe	Negligible    Millor   Moderate   Severe	Negligible Minor Wooderste  Channel Alteration  Channel Atteration	CSX			R2SB	02070011	08/11/2016	02-STR-83			
Channel Alteration  Channel Alteration  Channel Channe	Negligible    Millor   Moderate   Severe	Negligible Minor Wooderste  Channel Alteration  Channel Atteration   4. CHANNEL	L ALTERATION: Stream crossin	ngs, riprap, concre	ete, gabions, or co	ncrete blocks, stra	ightening of chanr	nel, channelization	, embankments,	NOTES>>		
Channel   Chan	Negligible Minor School (1997)	Negligible  Channel Channel Alteration  Channel Alteration  Channel Alteration  Channel Channe	spoil piles, const	trictions, livestock		Condition	al Catoners				-	
Channel Alteration  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  SCORE  1.5  1.3  1.1  0.9  0.7  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  SCORE  1.5  1.3  1.1  0.9  0.7  0.5  Creater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  SCORE  1.5  1.3  1.1  0.9  0.7  0.5  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	Channel Alteration  Channel Channel Alteration  Channel Channel Channel Channel Alteration  Channel Ch	Channel Channe		Negligible	Mi			lerate	Sev	/ere	-	
SCORE   1.5   1.3   1.1   0.9   0.7   0.5   1.1   1.2   1.3   1.1   0.9   0.7   0.5   1.3   1.1   1.3   1.1   0.9   0.7   0.5   1.3   1.1   1.3   1.1   1.3   1.1   1.3   1.1   1.3   1.1   1.3   1.1   1.3   1.1   1.3   1.3   1.1   1.3   1.3   1.1   1.3   1.	SCORE 1.5 1.3 1.1 0.9 0.7 0.5 17 REACH CONDITION INDEX and STREAM CONDITION UNITS REACH 19 REACH CONDITION INDEX (RCI)> 1 RCIc (Sum of all CFs)/5 COMPENSATION REQUIREMENT (CR)> CR = RCI X LF X IF	SCORE 1.5 1.3 1.1 0.9 0.7 0.5 1  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The Cis and RCI should be repended to 2 decimal pisces. The CR should be repended to 3 whole running.  THE REACH CONDITION INDEX (RCI)> 1  RCI:= (Sum of all CP3/5)  COMPENSATION REQUIREMENT (CR)> COMPENSATION REQUIREMENT (CR)>  INSERT PHOTOS:		Channelization, dredging, alteration, or hardening absent. Stream has an	the stream reach is disrupted by any of the channel alterations listed in the parameter	stream reach is disrupted by any of the channel alterations listed in the parameter	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	Greater than 80% of by any of the chann in the parameter g	nel alterations listed juidelines AND/OR ored with gabion,		
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >> 1  RCI= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (CR) >>   CR = RCI X LF X IF	NOTE: The CL and RC inducted to 2 decimal places. The CR should be rounded to a whole number.    THE REACH CONDITION INDEX (RCI) >>     RCI-s (gum of all Clay)S     COMPRESSION REQUIREMENT (RR) >>     CR = RCI × LF × IF     NISERT PHOTOS:	INSERT PHOTOS:  THE REACH CONDITION INDEX (RCI)>>   RCILE SQUAR of all CTS)/S  COMPRISE TO REACH SQUAREMENT (CR) >>   REACH CONDITION INDEX (RCI)>>   RCILE SQUAREMENT (CR) >>   RCILL	SCORE	1.5	1.3	1.1	1		0	.5		
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >> 1  RCI= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (CR) >>   CR = RCI X LF X IF	NOTE: The CL and RC inducted to 2 decimal places. The CR should be rounded to a whole number.    THE REACH CONDITION INDEX (RCI) >>     RCI-s (gum of all Clay)S     COMPRESSION REQUIREMENT (RR) >>     CR = RCI × LF × IF     NISERT PHOTOS:	INSERT PHOTOS:  THE REACH CONDITION INDEX (RCI)>>   RCILE SQUAR of all CTS)/S  COMPRISE TO REACH SQUAREMENT (CR) >>   REACH CONDITION INDEX (RCI)>>   RCILE SQUAREMENT (CR) >>   RCILL		REACH	CONDITION	INDEX and S	STREAM COI	NDITION UNI	ITS FOR THIS	S REACH		
RCI= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	RCI= (Sum of all CFs)/5  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  INSERT PHOTOS:	RCI= (Sum of all Cris)/5  COMPENSATION REQUIREMENT (CR) >>  OR = RCI X LF X IF  INSERT PHOTOS:	NOTE: The Cls and R								CONDITION IN	NDEX (RCI) >>
CR = RCI X LF X IF	INSERT PHOTOS:  CR = RCIXLF X IF	INSERT PHOTOS:										
	INSERT PHOTOS:	INSERT PHOTOS:										EMENT (CR) >>
INSERT PHOTOS:										CR = RC	I X LF X IF	
		DESCRIBE PROPOSED IMPACT:										

1

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 08/11/2016

02-STR-83

Evaluator: L. Postaski, R. Porath	County: Staffor	rd	Longitude: -77	7.385973
Total Points: 39.25 Stream is at least intermittent		ination (circle on ermittent Perenn		
if ≥ 19 or perennial if ≥ 30*		erinitteri T ereini	e.g. Quau Name.	
			1	
A. Geomorphology (Subtotal = 19	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	N	o = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $11.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	1	(1.5)
16. Organic debris lines or piles	0	0.5	1)	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes	= 3
C. Biology (Subtotal = 8.75 )	•			
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	(1)	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians		0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method	ds. See p. 35 of manua			
Notes: The stream is located near a very steep be				
, ,				
Sketch:				

					lethodology f					
Dun't i		Dunis -t N		wadeable chan	nels classified a Cowardin			0.15 "	Impact/SAR	Impact
Project #		Project Name		Locality	Class.	HUC	Date	SAR#	length	Factor
N/A Nom		2RVA - Area		VA	R4SB	02070011	10/13/2015			
	ne(s) of Evalua tchell, M. Ro	` '	Stream Nam	e and Informa	ation	02-S	TR-84			
	Condition: Asse		tion of the stream	and prevailing of	ondition (erosion		1107			
	Opti				Conditional Catego		Po	or	Sev	/ere
	У	αι	A	Pennai	ivial	giriai	1		//	# M
		- HAPP	Clintal to in size of 4			less than Severe or stable than Severe	Overwidene Vertically/laterally		1	5
Channel Condition	and transverse bars few. Transient		erosion or unproter of banks are s Vegetative protect prominent (60 Depositional feal stability. The bar channels are we	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches,	or Poor due to lo Erosion may be pro both banks. Veget 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute	widen further. Major are near vertical. E 60-80% of bant protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp	ority of both banks rosion present on its. Vegetative on 20-40% of fficient to prevent its 60-80% of the id by sediment.	Deeply incised vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sid	stability. Severe attained within the ed below average najority of banks but. Vegetative on less than 20% of eventing erosion.
	bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than		portions of the r sediment cover	d floodplains along reach. Transient rs 10-40% of the bottom.	stability, may be AND/OR V-shap vegetative protecti banks and depositi	on that contribute to forming/present. ed channels have ion on > 40% of the ional features which to stability.	nature, and contrib AND/OR V-shape vegetative protection 40% of the barn sediment depos	d channels have on is present on > ks and stable	Erosion/raw ban AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	aks on 80-100%.  g channel. Greater  bed is covered by  buting to instability.  channels and/or
Score	3	3		3 2.4 2 1.6		1				
NOTES>>		Inte	rmittent str	ream assoc	iated with	seep. Field	Sheet 06-S	TR-09 Tea	am 2.	
	N BUFFERS: A	Assess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep	table)	
	N BUFFERS: /	Assess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen ginal	ts of length & widt	h may be accep	table) NOTES>> Associated	l with a
	Opti	Assess both bank imal  - 3 inches) present, noches over and a derstory. Wetlands	Con Subo  Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ripanian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	table)	I with a
RIPARIAI Riparian Buffers Condition	Opti Tree stratum (dbh swith > 60% tree canon-maintained und	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	table) NOTES>> Associated	I with a
Riparian Buffers  Condition Scores  Delineate rip secriptors. Determine so	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin Score for each ri 100%	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	table) NOTES>> Associated	I with a
Riparian Buffers  Condition Scores  Delineate rip Secriptors. Determine stellow. Enter the %	Tree stratum (dbh: with > 60% tree conon-maintained un located within the located within	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	table) NOTES>> Associated	
Riparian Buffers  Condition Scores  Delineate rip Secriptors. Determine stellow. Enter the %	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	Assess both bank imal  3 inches) present, anopy cover and a dierstory. Wetlands e riparian areas.  5  each stream ban each by measurin Score for each ri 100% 1.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Associated seep.  Cl= (Sum % RA * S Rt Bank Cl >	cores*0.01)/2 1.50
Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine st slow. Enter the %  Right Bank	Tree stratum (dbh a with a 60% tree cc non-maintained una located within the located with	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin Score for each ri 100% 1.5	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in	an areas along the ditional Categories and Congth and width. Can the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are province.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies the seeded and stabilized and stabilize	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums imparian qual 100 100%	NOTES>> Associated seep.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2
Riparian Buffers  Condition Scores Delineate rip scriptors. Determine sclow. Enter the % Right Bank  Left Bank	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	Assess both bank  imal  3 inches) present, anopy cover and a dierstory. Wetlands er iparian areas.  5  each stream ban each by measurin 100% 1.5  100% 1.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (In the blocks below the blocks below the blocks below the same congest and depths; wores.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies the seeded and stabilized and stabilize	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums imparian qual 100 100%	NOTES>> Associated seep.  Cl= (Sum % RA * S Rt Bank Cl >	cores*0.01)/2 1.50
Riparian Buffers  Condition Scores Delineate rip scriptors. Determine solow. Enter the % Right Bank  Left Bank  INSTREAI dercut banks Instream	Tree stratum (dbh: with > 60% tree conon-maintained un located within th  1. carian areas along of the stratum areas along of the stratum area and score >  M Riparian Area > Score >  M HABITAT: Va; root mats; SAV; r	Assess both bank  imal  - 3 inches) present, enopy cover and a derstory. Wetlands er iparian areas.  5.5  - 3 inches) present, enopy cover and a derstory. Wetlands er iparian areas.  100% 1.5  100% 1.5  aried substrate si	Con Subo  Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  K into Condition C g or estimating leeparian category in parian category in the parian category in the second containing leeparian category in the second category in th	an areas along the ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below th	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided to the condition of the condition	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	Is of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Associated seep.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2 1.50
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Riparian Buffers  Condition Scores Delineate rip scriptors. Determine solow. Enter the % Right Bank  Left Bank  INSTREAI dercut banks Instream	Tree stratum (dbh : with > 60% tree cc conon-maintained und located within the located wi	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5.5  each stream ban each by measurin  100%  1.5  100%  1.5  aried substrate si fiftle poole completimal  re typically present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (6th > 3 inches) present, with +20% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Associated seep.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	cores*0.01)/2 1.50

	St	ream In	npact A	ssessm	ent For	m Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	DC2RVA - Segme	nt 06	VA	R4SB	02070011	10/13/2015	02-STR-84			
4. CHANNEL	_ ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	traightening of ch	hannel, channeliz	ation,	NOTES>>		
embankments, s	poil piles, constrictions, livestock		Conditiona							
	Negligible	Mir	nor		erate	Sev	ere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		of the channel in the parameter PR 80% of banks bion, riprap, or			
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5			1.50
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			
NOTE: The CIs and R	CI should be rounded to 2 decimal places. T	he CR should be roun	ided to a whole number	er.				CONDITION IN		
								I= (Sum of all C		_
						'		ION REQUIRE	vi⊨NI(CR)>>	0
INSERT PHO	TOS.						UN = RU	'' ∨ FI. ∨ IL		
DESCRIBE F	PROPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11

02-STR-84

Date: 10/13/2015	Project/Site: DC2RVA - Area 02	Latitde: 38.386522
Evaluator: D. Mitchell, M. Rockwell	County: Stafford	Longitude: -77.386534
<b>Total Points:</b> 20.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 5.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	(0)	Y	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	<b>(1)</b>	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	7	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $6.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5		1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
C. Biology (Subtotal = 8.25)	_			
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	Y	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	<b>(</b> 0 <b>)</b>	0.5	1	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = $0.75$ ;	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other metho				
Notes: Seep located at 38.386403, -77.386475; s	stream originates fi	om seep. Field	Sheet 06-STR-09 T	eam 2.
Sketch: Seek W	ietland			Perennia Stream

		Stre					(For	m 1)			
				fied Stream N wadeable chan							
Project #	ı	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	02	VA	R2SB3	02070011	09/01/2016				
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation	1	1				
						02-S	ΓR-85				
1 Channel C	Condition: Asse	ess the cross-sec	tion of the stream	and prevailing o	andition (erosion						
i. Onamici c				C	onditional Catego	ry					
	Opti	imal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	"	- MAR	7		Often incised, but	less than Severe or	Overwidene	ed/incised.	1	5	
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully	on or natural rock, 100%). AND/OR /bankfull benches ess to their original y developed wide	erosion or unproted of banks are st Vegetative protect prominent (60 Depositional feat stability. The bar channels are wel	ew areas of active cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches,	Poor. Banks more or Poor due to lo Erosion may be pri both banks. Vegel 40-60% of banks. bevertical or unde 60% of strean sediment. Sec	stable than Severe ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient. contribute	Vertically/laterally widen further. Major	unstable. Likely to ority of both banks rosion present on ks. Vegetative nt on 20-40% of fficient to prevent & 60-80% of the ed by sediment.	vertical/lateral in incision, flow con banks. Streamber rooting depth, metrical/undercontection present cobanks, is not pre	stability. Severe stained within the ad below average sajority of banks ut. Vegetative on less than 20% of eventing erosion.	
	and transverse ba sediment depositio 10% of	on covers less than bottom.	or newly develope portions of the r sediment cover stream	d floodplains along reach. Transient rs 10-40% of the bottom.	instability. Depositi stability, may be AND/OR V-shap vegetative protecti banks and depositi contribute	on that contribute to forming/present. ed channels have on on > 40% of the ional features which to stability.	nature, and contrit AND/OR V-shape vegetative protecti 40% of the bar sediment depos	outing to instability.  Id channels have on is present on >  Iks and stable  iition is absent.	Obvious bank sle Erosion/raw ban AND/OR Aggradin than 80% of stream deposition, contrib Multiple thread of subterran	ks on 80-100%. g channel. Greater h bed is covered by uting to instability. channels and/or ean flow.	С
Score	3	3	2	4		2	1.	6	1		
2. RIPARIAI	N BUFFERS: A	A b-th b									
		Assess both bank				ugh measuremen	ts of length & widt	h may be accep			
	Opti		Con	ditional Cate	gory		ts of length & widt		NOTES>>	nixed	
Riparian Buffers	Tree stratum (dbh : with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree		gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (4bh > 3 inches) present, with <a href="#">430% tree</a> canopy cover with maintained understory.			NOTES>> Banks are n forest.	nixed	
Buffers	Tree stratum (dbh : with > 60% tree canon-maintained und	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> Banks are n forest.	nixed	
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Condition Scores  1. Delineate ripidescriptors. 2. Determine so	Tree stratum (dbh swith > 60% tree or non-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Banks are n forest.	nixed	
Condition Scores  1. Delineate ripidescriptors. 2. Determine so	Tree stratum (dbh swith > 60% tree or non-maintained un located within the located lo	imal  3 inches) present, anopy cover and a derstory. Wetlands the riparian areas.  5  each stream ban each by measurin Score for each ri	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in 20%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Banks are n forest.	nixed	
Condition Scores  1. Delineate rip: descriptors. 2. Determine scoelow. 3. Enter the % I	Tree stratum (dbh swith > 60% tree or non-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Banks are n forest.		
Condition Scores  1. Delineate rip- descriptors. 2. Determine scoelow. 3. Enter the % I	Tree stratum (dbh : with > 60% tree cc non-maintained une located within th  1. arian areas along a quare footage for e Riparian Area and % Riparian Area> Score >	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin Score for each ri 80% 1.1	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in 20%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	NOTES>> Banks are n forest.	cores*0.01)/2	CI
Condition Scores  Delineate riplescriptors. Determine scielow. Enter the % I	Tree stratum (dbh swith > 60% tree or non-maintained un located within the located lo	imal  3 inches) present, anopy cover and a derstory. Wetlands the riparian areas.  5  each stream ban each by measurin Score for each ri	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in 20%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Banks are n forest.		CI
Condition Scores  1. Delineate ripidescriptors. 2. Determine schelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th  1. arian areas along the strategy of the strategy	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  80%  1.1  100%  1.2  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 1.2  Zes, water velocit	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are prov.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Banks are n forest.  Cl= (Sum % RA * S Rt Bank CI >	cores*0.01)/2 1.12	
Condition Scores  1. Delineate ripidescriptors. 2. Determine schelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  80%  1.1  100%  1.2  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 1.2  zes, water velocit exes, stable feature	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Acalculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other confer conferious.  Low 0.5  Low 100%  100%	NOTES>> Banks are n forest.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2 1.12	
Condition Scores  1. Delineate ripidescriptors. 2. Determine Scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th  1. arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  M HABITAT: Va root mats; SAV; r	imal  > 3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5  each stream ban each by measurin Score for each ri 80% 1.1  100% 1.2  aried substrate si iffle poole completimal are typically present	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in 20% 1.2  zes, water velocities system in 30-50% Stable habitat eleepresent in 30-50% are adequate for are stratum in 30-50% are adequate for areas are stratum in 30-50% are adequate for areas a	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below ty and depths; wo res.  Conditiona ptimal  ments are typically % of the reach and remaintenance of	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us calculators are provided and leafy detail Category  Mar.  Stable habitat ele present in 10-30% are adequate for a	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically % of the reach and remaintenance of	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks en Bl	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5   NOTES>> Banks are n forest.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	cores*0.01)/2 1.12	1.1	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/ Available	Tree stratum (dbh : with > 60% tree cc non-maintained un located within th  1. arian areas along to the control of the control	imal  > 3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5  each stream ban each by measurin Score for each ri 80% 1.1  100% 1.2  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le  parian category in 20% 1.2  zes, water velocit exes, stable featur  Subo  Stable habitat ele present in 30-50% are adequate fo popul	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically % of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks end  Ale; low embeded  Habitat elements lacking or are ur	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%  100%	NOTES>> Banks are n forest.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	cores*0.01)/2 1.12	

### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point Project # Date SAR length Impact Factor R2SB3 02070011 09/01/2016 02-STR-85 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. is disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has been guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. SCORE 1.5 1.3 1.1 0.9 0.7 0.5 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### **INSERT PHOTOS:**



Top Left: Typical view of stream Top Right: Typical view of stream Bottom Right: Typical view of stream



NC DWQ Stream Identification Form Version 4.11

02-STR-85

Date: 09/01/2016	Project/Site: DC2RVA	Latitude: 38.388280
Evaluator: L. Eggering, L. Postaski	County: Stafford	Longitude: -77.387587
<b>Total Points:</b> 23 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 15)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence	_			
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0		2	3
7. Recent alluvial deposits	0	1)	2	3
8. Headcuts	0	①	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	①	1.5
11. Second or greater order channel	No	o = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 8				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes :	= 3
C. Biology (Subtotal =)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.76;	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other methods.	See p. 35 of manua	al.		
Notes: This stream has incised banks, ~85% slopes	, ~ 5 ft high. Or	iginal Field Shee	t: 6-A-STR-03 (rew	ork).
·	<del>_</del>		•	
		STR-0	74	
Sketch: mixed	d Forest			
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mixed	d Forest			

		Stre			ment Methodology f		(Fori	m 1)			
			For use in	wadeable chan	nels classified a	s intermittent or	perennial		Immost/CAD	lmmaat	
Project #	ı	Project Name	•	Locality	Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		DC2RVA		VA	R2SB3	02070011	09/01/2016				
	e(s) of Evaluat	` '	Stream Nam	e and Informa	ation	00.07	FD OC				
	gering, L. Po		for the state of	1			TR-86				
Channel	ondition: Asse			C	Conditional Catego	ry	_		_		
	Opti	imal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
		W.	Slightly incised, fu	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally u		Deeply incised	(or excavated)	
Channel Condition	Very little incision or active erosion; 80- 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.		of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream of the bankfull benches, d floodplains along reach. Transient	Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Set temporary/tran instability. Depositiv.	ower bank slopes. esent on 40-60% of tative protection on Streambanks may brout. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Majc are near vertical. E 60-80% of banh protection preser banks, and is insul erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	rosion present on s. Vegetative it on 20-40% of ficient to prevent 60-80% of the d by sediment. prary/transient in uting to instability.	vertical/lateral in: incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank slo Erosion/raw ban	stability. Severe tained within the do below average tajority of banks ut. Vegetative in less than 20% of venting erosion. Dughing present. ks on 80-100%.	
			sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the band sediment depos	n is present on > ks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	.4	:	2	1.	6	1		2.4
					iala Chaat.	C A OTD A	4 (				
	N BUFFERS: A	Assess both bank	s's 100 foot riparia	Original Fi				n may be accep	table)		
			Con	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt		NOTES>>		
	Opti	imal	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches)	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches)	gory  Mare  High Marginal: Non-maintained, dense herbaceous	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland;	Low Poor: Impervious surfaces, mine		ed forest, ending	
	Opti Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation,	Poo  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor:	NOTES>> The right de bank is mixe the left dece	ed forest, ending	
RIPARIAI Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree cc non-maintained und located within the	imal  > 3 inches) present, anopy cover and a derstory. Wellands eriparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.	NOTES>> The right de bank is mixe the left dece	ed forest, ending	
RIPARIAI Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wellands eriparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Poo  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> The right de bank is mixe the left dece	ed forest, ending	
Riparian Buffers  Condition Scores Delineate ripasscriptors. Determine scolow.	Opti Tree stratum (dbh > with > 60% tree cc non-maintained und located within the	imal  - 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  -5  -5  -6  -6  -6  -6  -6  -6  -6  -6	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> The right de bank is mixe the left dece	ed forest, ending	
Riparian Buffers  Condition Scores Delineate ripascriptors. Determine scalow. Enter the % I	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	imal  - 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  -5  -5  -6  -6  -6  -6  -6  -6  -6  -6	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> The right de bank is mix the left dece bank is upla	ed forest, ending and.	
Riparian Buffers  Condition Scores  Delineate rip: secriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wellands e riparian areas.  5  each stream ban each by measuring Score for each r 100%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> The right de bank is mixe the left dece	ed forest, ending and.	CI
Riparian Buffers  Condition Scores  Delineate rip: secriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree oc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands the riparian areas.  5  each stream ban each by measurin Score for each r 100% 1.2	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel tolls, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%	NOTES>> The right de bank is mix the left dece bank is upla	ed forest, ending and.	CI 1.16
Riparian Buffers  Condition Scores  Delineate rip. Secriptors. Determine sclow. Enter the % I	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	imal  3 inches) present anopy cover and a derstory. Wetlands derstory. Wetlands er iparian areas.  5  each stream ban each by measurin 100% 1.2 20% 1.2 aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  80% 1.1  zes, water velocit	an areas along the ditional Categories and Congth and width. Congt	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are province.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks economics of the seconomics of	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lols, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> The right de bank is mix the left dece bank is upla  Cl= (Sum % RA * Se Rt Bank CI >	ed forest, ending and.	
Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine scolow. Enter the % I Right Bank  Left Bank  INSTREAL	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5.5  each stream ban each by measuring Score for each race of the stream ban each by measuring Score for each race of the stream ban each by measuring Score for each race of the stream ban each by measuring Score for each race of the stream ban each by measuring Score for each race of the stream ban each by measuring Score for each race of the stream ban each by measuring stream ban each by meas	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in  80% 1.1 zes, water velocit exes, stable feature	an areas along the ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Coungth and width. Coungth and width. Coungth and width. Coungth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provious and leafy detail Category	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks ed.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or ther comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> The right de bank is mix the left dece bank is upla  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	ed forest, ending and.	
Riparian Buffers  Condition Scores Delineate rip sescriptors. Determine sc slow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree oc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands to riparian areas.  5  each stream ban each by measurin Score for each r 100% 1.2 20% 1.2 aried substrate si iffle poole completimal	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  80% 1.1  zes, water velocit exes, stable featur  Subo Stable habitat elei	an areas along the ditional Categories and Council Categories and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks ee Bloc	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel foliations.  Low 0.5   NOTES>> The right de bank is mix the left dece bank is upla  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	ed forest, ending and.		
Condition Scores  Delineate ripsescriptors. Determine scelebrate the % I Right Bank  Left Bank  INSTREAI ndercut banks;	Tree stratum (dbh > with > 60% tree oc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5.5  each stream ban each by measuring Score for each race to 100% 1.2  20% 1.2  aried substrate si fifte poole completimal  re typically present	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches with tree stratum (dbh - 3 inches present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leep arian category in 20% to 1.1  zes, water velocities, stable features, stable features, stable features, stable features, stable habitat elepresent in 30-50% are adequate for are stratum of the stable features.	an areas along the ditional Categorithmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaecous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>20</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks educate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%	NOTES>> The right de bank is mix the left dece bank is upla  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	ed forest, ending and.	

Project#	Applicant		Locality	SSESSM	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	csx		VA	R2SB3	02070011	09/01/2016	02-STR-86			
	_ ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, conc	rete, gabions, or	concrete blocks, s	straightening of ch	nannel, channeliz	ation,	NOTES>>	•	
,	F F		Conditiona	I Category						
	Negligible	Mir	nor	Mode	erate	Sev	ere			
Channel Alteration	or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		Greater than 8i disrupted by any alterations listed i guidelines AND/O shored with gal cem	of the channel n the parameter R 80% of banks oion, riprap, or ent.			
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5			1.50
	REACH C	ONDITION IN	NDEX and S	TREAM CON	IDITION UN	ITS FOR TH	IS REACH			
TE: The CIs and R	CI should be rounded to 2 decimal places. T	he CR should be roun	ded to a whole number	er.			THE REACH	CONDITION IN	DEX (RCI) >>	
							RC	I= (Sum of all C	l's)/5	
						(	COMPENSAT	ION REQUIRE	MENT (CR) >>	0
						•	CR = RC	XLFXIF		

INSERT PHOTOS:





Top Left: Typical view of stream
Top Right: Typical view of stream
Bottom Left: Typical view of stream in
approximate location of new stream
crossing

ECCDIBE	DDODOSED	IMDACT:

Project/Site: DC2RVA

NC DWQ Stream Identification Form Version 4.11

Date: 09/01/2016

02-STR-86

04010.0021(7)		31100		
ty: Stafford	Longitude: -77	Longitude: -77.387740		
m Determination (circle one meral Intermitten Perennia		Other e.g. Quad Name:		
bsent Weak	Moderate	Strong		
0 1	2	(3)		
0 1	(2)	3		
0 1	2	3		
0 1	2	3		
0 1	2	3		
0 1	2	3		
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0 0.5		1.5		
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0 1	2	3		
0 (1)	2	3		
1.5	0.5	0		
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No = 0	Yes:			
_				
(3) 2	1	0		
3 2	1	0		
0 1	2	3		
<b>(</b> 0 <b>)</b> 1	2	3		
0 0.5	(1)	1.5		
0 0.5	(1)	1.5		
0 0.5	(1)	1.5		
0 0.5		1.5		
FACW = 0.75; (	OBL = 1.5 Other = 0			
35 of manual.				
mixed Forest				
o-A-STR-04 ←	_			
D GA-STR-OH	-			
D	Mixed forest	Mixed forest		

	⊏pne	mera		fied Stream N	lethodology f	or use in Virg		(Fori	m 1a)	
Project #		Project Name	)	Locality	e in ephemeral s Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A		DC2RVA		VA	R6	02070011	09/01/2016			
	e(s) of Evaluation		Stream Nam	e and Informa	ation	02-S	ΓR-87			
	BUFFERS: A		's 100 foot riparis	un areas along the	ontiro SAR (ro			th may be accept	abla)	
I KII AKIAN	I DOI I ERO. F	ASSESS DOUT DATE	•	ditional Cate	-	agii measuremen	is or length & wid	п пау ве ассерь	NOTES>>	
Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree canon-maintained und are	> 3 inches) present, nopy cover and an derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands,	This stream 6-A-STR-04 Mixed fores present on banks. Orgi Sheet: 6-A (rework).	(rework) st is both inal Field
			High	Low	High	Low	High	Low		
Condition Scores	1.		1.2	1.1	0.85	0.75	0.6	0.5		
escriptors.	rian areas along						Ensure	the sums		
. Determine sq elow.	uare footage for e	ach by measurin	g or estimating le	ngth and width. (	Calculators are pr	ovided for you	of % F	Riparian		
Enter the % F	tiparian Area and		parian category in	the blocks below	v.		Blocks 6	equal 100		
Right Bank	% Riparian Area> Score >	100% 1.2						100%		
_	% Riparian Area>	100%						100%	CI= (Sum % RA * S Rt Bank CI >	3cores*0.01)/2
Left Bank	% Riparian Area>	1.2						100%	Lt Bank CI >	1.20
		REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH		
TE: The CIs and R	CI should be rounded	to 2 decimal places. T	The CR should be roun	ded to a whole number	er.				CONDITION IND	
									CI= (Riparian CI ON REQUIREM	,
									X LF X IF	
ESCRIBE 5	ROPOSED III	<b>ЛРАСТ</b> -								
ESCRIBE F	PROPOSED IN	IPACT:								

Project/Site: DC2RVA

NC DWQ Stream Identification Form Version 4.11

Date: 09/01/2016

02-STR-87

Latitde: 38.387741

rmination (circle one) ntermittent Perennial  Weak  1  1  1  1  1  1  0.5  No = 0	Moderate  2 2 2 2 2 2 2 1 1 Yes =	
Weak 1 1 1 1 1 1 1 0.5 0.5	e.g. Quad Name:  Moderate  2 2 2 2 2 2 2 2 1 1	Strong  3  3  3  3  3  3  1.5
1 1 1 1 1 1 1 1 0.5	2 2 2 2 2 2 2 2 2 1	3 3 3 3 3 3 3 3 1.5
1 1 1 1 1 1 1 0.5	2 2 2 2 2 2 2 2 1	3 3 3 3 3 3 3 1.5
1 1 1 1 1 1 0.5	2 2 2 2 2 2 2 1 1	3 3 3 3 3 3 1.5
1 1 1 1 0.5 0.5	2 2 2 2 2 2 1 1	3 3 3 3 3 1.5
1 1 1 1 0.5	2 2 2 2 1 1	3 3 3 3 1.5
1 1 1 0.5 0.5	2 2 2 1 1	3 3 3 1.5
1 1 0.5 0.5	2 2 1 1	3 3 1.5
1 0.5 0.5	2 1 1	3 1.5
0.5	1	1.5
0.5	1	
		1.5
No = 0	Yes =	
		= 3
1		
1	2	3
1	2	3
1	0.5	0
0.5		1.5
0.5		1.5
No = 0	Yes =	= 3
(2)	1	0
2	1	0
1	2	3
1	2	3
0.5	11	1.5
0.5	(1)	1.5
0.5	1	1.5
0.5		1.5
FACW = 0.75; OF	BL = 1.5 Other = 0	
nual.		
6-A		
	0.5 0.5 0.5 FACW = 0.75; OF	0.5 0.5 0.5 1 0.5 FACW = 0.75; OBL = 1.5 Other = 0

N/A DC2RVA - Area 02 VA R6 02070011 N/A 1  Name(s) of Evaluator(s)  Stream Name and Information  02-STR-88  RIPARIAN BUFFERS: Assess both banks 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Coptimal Suboptimal: (we Suboptimal: Reparian areas with tree stratum, (feb) > 3 inches) present, incommendation (feb) > 3 inches) present, incomplete, inco	Project Name  NA  DC2RVA - Area 02  VA  R8  0.2070011  NA  NA  DC2RVA - Area 02  VA  R8  0.2070011  NA  NA  DC2RVA - Area 02  VA  R8  0.2070011  NA  DC2-STR-88  RIPARIAN BUFFERS: Assass both have 100 tool operand areas along the entre SAR. (Tough measurement of legin, 8 with may be acceptance)  Conditional Category  Copinial  Social cards  Riparian  DC2-STR-88  RIPARIAN BUFFERS: Assass both have 100 tool operand areas along the entre SAR. (Tough measurement of legin, 8 with may be acceptance)  Conditional Category  DC3-STR-88  RIPARIAN BUFFERS: Assass both have 100 tool operand areas along the entre SAR. (Tough measurement of legin, 8 with may be acceptance)  Conditional Category  DC3-STR-88  RIPARIAN BUFFERS: Assass both have 100 tool operand areas along the entre SAR. (Tough measurement of legin, 8 with may be acceptance)  Conditional Category  DC3-STR-88  RIPARIAN BUFFERS: Assass both have 100 tool operand areas along the entre SAR. (Tough measurement of legin, 8 with may be acceptance)  Conditional Category  DC3-STR-88  RIPARIAN BUFFERS: Assass both have 100 tool operand areas along the entre SAR. (Tough measurement of legin, 8 with may be acceptance)  Conditional Category  DC3-STR-88  RIPARIAN BUFFERS: Assass both have 100 tool operand areas along the entre SAR. (Tough measurement of legin, 8 with may be acceptance)  RIPARIAN BUFFERS: Assass both have 100 tool operand areas along the entre SAR. (Tough measurement of legin service)  RIPARIAN BUFFERS: Assass both have 100 tool operand areas along the entre SAR. (Tough measurement of legin service)  RIPARIAN BUFFERS: Assass both have 100 tool operand areas along the entre SAR. (Tough measurement of legin service)  RIPARIAN BUFFERS: Assass both have 100 tool operand areas along the entre SAR. (Tough measurement of legin service)  RIPARIAN BUFFERS: Assass both have 100 tool operand areas along the entre SAR. (Tough measurement of legin service)  RIPARIAN BUFFERS: Assass both have 100 tool operand areas along the entre SAR. (Tough measurement of legin service)	Project # Project Name   Locality   Cowardin   Class   HUC   Date   SAR # Impact/SAR   Impact   SAR   Impact		Брис	mera		fied Stream N	/lethodology f	or use in Virg		(- (-	π ια,	
Name(s) of Evaluator(s)   Stream Name and Information	N/A DC2RVA - Area 02 VA R6 02070011 N/A 1  Stream Name and information  O2-STR-88  RIPARIAN BUFFERS: Access both banks 100 lock incurin areas durag the entire SAR, (bugh measurements of length & wideh may be acceptable.)  Optimal Subsequent S	N/A DC2RVA - Area 0.2 VA R6 0.2070011 N/A 0.1 1  Name(s) of Evaluator(s) Stream Name and information  O2-STR-88  RIPARIAN BUFFERS: Assess both bank's 150 lost (greater and stream) the control of the co	Project #		Project Name	•		Cowardin		Date	SAR#		
Name(s) of Evaluator(s)   Stream Name and Information   O2-STR-88	RIPARIAN BUFFERS: Access both sark's 100 but rivers a areas storage the entities SAR, (togal measurements of recgiffs & width may be accessible)  Optimal Suboptimal Warring Suboptimal	Name(g) of Evaluator(g)  RIPARIAN BUFERS: Assessed point boars 300 foot ripostes areas among the werse BAR. (rough measurements of leging & within tings from the street of the street o	-	DC	2RVA - Area	02			02070011	N/A		length	
Conditional Category   Poor   Field sheets missing,	Conditional Category  Optimal Suboprimal Rights Response with the strong of the common SAN. (Brough measurements of large A weekers of large A wee	Conditional Category    Page		_				-					
Optimal Suboptimal Category  Suboptimal High Suboptimal Riparian areas with tree stratum (bit > 3 inches) present, with > 60% tree caropy cover and an inor-manifalized sunderstory. Welfands areas.  Buffers  Riparian areas with tree stratum (bit > 3 inches) present, with > 60% tree caropy cover and an inor-manifalized sunderstory. Welfands areas.  Buffers  Riparian areas areas along each stream bank into Condition Categories and Condition Scores using the learning system of too scores and an shrub layers or a received from manifalized understory.  Belimeate riparian areas along each stream bank into Condition Categories and Condition Scores using the learning system of too scores and an stream bank into Condition Categories and Condition Scores using the learning system of too scores and an solub layers or a received for you will be some the stratum (bit > 3 inches) (bit > 3 inc	Optimal Suboptimal Marginal Unity Poor India Suboptimal Marginal Unity Poor India Suboptimal Marginal General Process with the Gibbs and Control Process with the Gibbs and Control Process of the Control Pro	Condition  1. Co							02-S	ΓR-88			
Optimal Suboptimal High Suboptimal Riparian areas with tree stratum (bh > 3 inches) present, with > 60% tree caropy cover and an inor-manifalized understory. Welfans areas with rese stratum (bh > 3 inches) present, with > 60% tree caropy cover and an inor-manifalized understory. Welfans areas with rese stratum (bh > 3 inches) present, with > 60% tree caropy cover and an inor-manifalized understory. Welfans areas along each stream bank into Condition Categories and Condition Scores using the learning trained and shrub layers or a received from the condition of t	Optimal Suboptimal Marginal Unity Poor India Suboptimal Marginal Unity Poor India Suboptimal Marginal General Process with the Gibbs and Control Process with the Gibbs and Control Process of the Control Pro	Condition  1. Subportinal  Wigh Subportinal  Wig	. RIPARIAN	BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	th may be accept	able)	
High Suboptimat: Riparian areas with rese stratum (dbh > 3 inches) present, with 30% free canopy cover and an on-maritaned understory. Wetlands areas.  Wetlands areas.  High Marginal: With rese stratum (dbh > 3 inches) present, with 30% free canopy cover and an on-maritaned understory. Wetlands areas.  High Clow Present with 30% free canopy cover and an on-maritaned understory. Wetlands areas.  High Marginal: Non-maritaned understory. Wetlands and containing both herbaceous and shrub kyers or a normal shr	Riparian  The cardian (lith 3 a lance) present with the spark of the cardian (lith 4 a lance) present with the spark of the cardian (lith 4 a lance) present with the spark of the cardian (lith 4 a lance) present with the spark of the cardian (lith 4 a lance) present with the spark of the cardian (lith 4 a lance) present with the spark of the cardian (lith 4 a lance) present with the spark of the cardian (lith 4 a lance) present with the spark of the cardian (lith 4 a lance) present with the spark of the spark of the cardian (lith 4 a lance) present with the spark of the sp	Riparian Buffers  International field of the second of the				Con	nditional Cate	gory				NOTES>>	
High   Low   High   High   Low   High   High   Low   High	High   Low   High   Low   High   Low   High   Low   High   Low   High   Low   Scores   Low   High   High   Low   High   High   Low   High   High   Low   High   High   High   Low   High	High		Tree stratum (dbh > with > 60% tree canon-maintained und	<ul> <li>3 inches) present, nopy cover and an derstory. Wetlands</li> </ul>	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Low Marginat: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces row crops, active feed lots, trails, or other comparable	information from aerials nearby field	filled out and
Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the criptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you with the square footage for each prize in category in the blocks below.  Blocks equal 100  Gright Bank    Mariparian Area   100%	Scores Delineate rigarian areas along such stream bank into Condition Categories and Condition Scores using the scriptors.  Delineate rigarian areas along such stream bank into Condition Categories and Condition Scores using the scriptors.  Delineating in the Secores Scores of the Secores Scores	Scores   1.2   1.1   0.85   0.75   0.6   0.5    Definition fraginaria areas along each stream bank into Condition Calegories and Condition Scores using the scoreptors.  Determine success along each stream bank into Condition Calegories and Condition Scores using the provided for you between the success and the score of the score	Can distan			High	Low	High		High	Low		
Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the criptors.  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the criptors.  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the criptors.  Of % Riparian  Blocks equal 100  Blocks equal 100  CI= (Sum % RA * Scores*0.01)/2  CI= (Sum % RA * Scores*0.01)/2  PARIPHIAN Area> 90% 10% 100% Rt Bank CI> 1.20  Lt Bank CI> 1.14  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF	Delineate parient areas along each stream bank into Condition Categories and Condition Scores using the circiptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you will be sourced to the square footage for each riparian category in the blocks below.  Score > 1.2   100%   1	Delineate spatial areas along each stream bank into Condition Categories and Condition Scores using the scriptors.  Determine square footage for each by measuring or estimating length and width. Categories and Evaluations are provided for you be considered by the stream of the Ripartian Areas and Score for each ripartian category in the blocks below.  Right Bank  **Registran Areas and Score for each ripartian category in the blocks below.  **Registran Areas and Score for each ripartian category in the blocks below.  **Left Bank  **Score > 1.2  **Description   100%  **Score > 1.2  **Registran Areas   90%   10%   100%		1.	5	1.2	1.1	0.85	0.75	0.6	0.5		
Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian  Blocks equal 100  Blocks equal 100  Blocks equal 100  Cl= (Sum % RA * Scores* 0.01)/2  Cl= (Sum % RA * Scores* 0.01)/2  Beft Bank  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	Determine square footage for each by measuring or eight and width. Calculators are provided for you will be provided for you will be provided for you give the blocks below.  Eight Bank Scote > 1.2	Determine square focuse for each ty measuring or estimating length and width. Calculators are provided for you of %, Riparran Research Secretary and Score for each repartan category in the blocks below.  Right Bank SR peritan Area and Score for each repartan category in the blocks below.  Right Bank SR peritan Area 100% Right Bank Soore > 1.2	Delineate ripa	arian areas along	each stream ban	k into Condition C	Categories and Co	ondition Scores us	sing the	Ensure	he sums	1	
## Store S	Eight Bank   % Riparian Area and Score for each riparian category in the blocks below.   Blocks equal 100	Right Bank   Superior Areas   100%   Source > 1.2	Determine sq	uare footage for e	ach by measurin	g or estimating le	ngth and width. (	Calculators are pr	ovided for you	of % F	Riparian		
Score     1.2	Score > 1.2   Column Na RA * Score* O 17)2	Score > 1.2   Clic (Sum % RA* Score*) 0.71/2   Clic (Sum % RA* S		Riparian Area and	Score for each r	iparian category in	n the blocks below	w.		Blocks e	qual 100		
Score   1.2   Cl= (Sum % RA * Scores*0.01)/2	Score > 1,2  Left Bank	Scores 1.2  Left Bank	light Bank								100%		
eft Bank         % Riparian Areas         90%         10%         Rt Bank CI >         1.20           Score >         1.2         0.6         Lt Bank CI >         1.14           E: The Cis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.         THE REACH CONDITION INDEX (RCI) >>           RCI= (Riparian CI)/2           COMPENSATION REQUIREMENT (CR) >>           CR = RCI X LF X IF	Left Bank Score > 1.2 0.6	Left Bank    Score >   1.2   0.6     1.00%   Rt Bank Cl >   1.20		Score >	1.2							Cl= (Sum % RA * Sc	ores*(0.01)/2
Score > 1.2 0.6 Lt Bank CI > 1.14  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  E: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	Score > 1.2 0.6 Lt Bank Cl > 1.14  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCl) >>  RCl= (Riperian Cl)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCl X LF X IF  SERT PHOTOS:	Score > 1.2 0.6 Lt Bank Cl > 1.14  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCl) >>  RCl= (Riperian Cl)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCl X LF X IF  SERT PHOTOS:	oft Bank	% Riparian Area>	90%	10%					100%		
E: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	THE Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  RCl= (Rigarian Cl)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  SERT PHOTOS:	THE Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  RCl= (Rigarian Cl)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  SERT PHOTOS:	Leit Dalik	Score >								Lt Bank CI >	1.14
RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  SERT PHOTOS:	RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  SERT PHOTOS:			REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION LIN	ITS FOR TH	IS REACH		
COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  SERT PHOTOS:	COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  SERT PHOTOS:	E: The CIs and R	CI should be rounded	to 2 decimal places				TETTION ON				
	SERT PHOTOS:	SERT PHOTOS:			piaces.	The CR should be roun	nded to a whole numb		NOTITION OIL		THE REACH (		<u> </u>
	SCRIBE PROPOSED IMPACT:	SCRIBE PROPOSED IMPACT:	SERT PHO	OTOS:	pieces.	The CR should be roun	nded to a whole numb				THE REACH ( R COMPENSATI	CI= (Riparian CI). ON REQUIREMI	/2

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date:

02-STR-88

Latitde: 38.387039

Total Points: 0 Stream is at least intermittent	Stream Determi	nation (circle one) ermittent Perennial	Other e.g. Quad Name:	
f ≥ 19 or perennial if ≥ 30*				
	Absout	Was als	Madausta	Ct
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
a. Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
B. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
. Active/relict floodplain	0	1	2	3
5. Depositional bars or benches	0	1	2	3
. Recent alluvial deposits	0	1	2	3
B. Headcuts	0	1	2	3
. Grade control	0	0.5	1	1.5
Natural valley	0	0.5	1	1.5
Second or greater order channel		0 = 0	Yes :	
artificial ditches are not rated; see discussions in manual		-	. 50	•
B. Hydrology (Subtotal =)				
2. Presence of Baseflow	0	1	2	3
3. Iron oxidizing bacteria	0	1	2	3
4. Leaf litter	1.5	1	0.5	0
5. Sediment on plants or debris	0	0.5	1	1.5
6. Organic debris lines or piles	0	0.5	1	1.5
7. Soil-based evidence of high water table?	No	o = 0	Yes :	
C. Biology (Subtotal =)	L	L		
8. Fibrous roots in streambed	3	2	1	0
9. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
3. Crayfish	0	0.5	1	1.5
4. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB		l
*perennial streams may also be identified using other metho	ods. See p. 35 of manua	<u> </u>		
	· · · · · · · · · · · · · · · · · · ·			
Notes: NC data for this resource not available (n				

		Stre	am A	ssess	ment	Form	(For	m 1)			
				fied Stream N							
				wadeable chan	nels classified a				Impact/SAR	Impact	
Project #		Project Name	•	Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A	DC	2RVA - Area	02	VA	R2SB	02070011	10/13/15				
	e(s) of Evaluat	` '	Stream Nam	e and Informa	ation	00 OT	D 00-				
	dnik, W. Moo						R-89a				
Channel C	Condition: Asse	ss the cross-sec	tion of the stream		ondition (erosion, conditional Categor						
	Opti	mal	Subo	ptimal		ginal	Po	or	Sev	rere	
	-	All			Often incised, but	less than Severe or	Overwiden	ed/incised.	1	5	
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-11 Stable point bars/l are present. Acce floodplain or fully bankfull benches.	nks. Vegetative n or natural rock, 20%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars,	erosion or unproted of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to	ew areas of active cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu- erosion. AND/OI stream is cover Sediment is temp nature, and contril	ority of both banks Frosion present on ks. Vegetative int on 20-40% of ufficient to prevent R 60-80% of the ed by sediment. porary/transient in buting to instability.	vertical/lateral ir incision, flow cor banks. Streamb rooting depth, n vertical/underd protection present banks, is not pre Obvious bank sl	(or excavated), stability. Severe tatained within the ed below average najority of banks but. Vegetative on less than 20% of eventing erosion. bughing present. liks on 80-100%.	
	and transverse dars lew. Translerit sediment deposition covers less than 10% of bottom. portions of the sediment construction of the sediment construction.		sediment cover	reach. Transient is 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have ion on > 40% of the ional features which to stability.			AND/OR Aggradin than 80% of strear deposition, contrit Multiple thread	g channel. Greater n bed is covered by outing to instability. channels and/or lean flow.	CI
Score	3	}	2	4	;	2	1.	.6	,	Į.	1.0
NOTES>>	N BUFFERS.		1. 400 (		Field Sheet 0						
. KIPAKIAI	N BUFFERS: A	issess both bank		ditional Cate		ugn measuremen	ts of length & wid	tn may be accep	NOTES>>	Right	
	Opti	mal		ptimal		ginal	Po	or	bank exten	•	
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the	nopy cover and a lerstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		oen. Left ns dense saplings	
			High	Low	High	Low	High	Low			
Condition Scores	1.	5	1.2	1.1	0.85	0.75	0.6	0.5			
Delineate ripa escriptors. Determine so elow.	arian areas along of quare footage for e	ach by measurin Score for each ri	g or estimating le	ngth and width. (	Calculators are pr	· ·	of % R	he sums tiparian qual 100			
Right Bank	% Riparian Area>	70%	30%					100%			
	Score >	0.5	0.85						CI= (Sum % RA * S	cores*0.01)/2	
Left Bank	% Riparian Area>	100%						100%	Rt Bank CI >	0.61	CI
	Score >	1.1							Lt Bank CI >	1.10	0.85
	M HABITAT: Va ; root mats; SAV; ri				ody and leafy deb	oris; stable substr	ate; low embeded	lness; shade;	NOTES>>	Plenty of	
Instream	, . Jot mato, OAV, II	poolo somple		Conditiona	l Category				deep pools habitat mos		
Habitat/	Opti	mal		ptimal		ginal		oor s listed above are		. J. Jour	
A !   -   -   -	Habitat elements ar	e typically present			present in 10-30%		lacking or are ur	nstable. Habitat			
Available	in greater than 50		present in 30-50% of the reach and are adequate for maintenance of populations.		present in 10-30% of the reach and are adequate for maintenance of		lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.			L	
Cover	in greater than 50	0% of the reach.	popul		popul	ations.	than 10% o				CI 1.20

Project #	Applicant	ream In	Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2SB	02070011	10/13/15	02-STR-89a	_	impact ractor	
	EL ALTERATION: Stream cross	sings riprap cond						NOTES>>		
nbankments,	spoil piles, constrictions, livestock	,,,,go,,,prap, conc	Conditiona		Strangthorning of or	riai irioi, oriai irioi.		Previously	channelized	
	Negligible	Mi			erate	Se	/ere	along base fill	of railroad	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than a disrupted by an alterations listed guidelines AND/s shored with ga	30% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or nent.			
SCORE	1.5	1.3	1.1	0.9	0.7		.5			0.50
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH				
E: The CIs and	RCI should be rounded to 2 decimal places.	The CR should be roun	ded to a whole numb	er.				I= (Sum of all C	` ,	
								ION REQUIRE		0
								I X LF X IF		
SERT PHO	OTOS:				100 C		W I/a	7.20 AM		
	Top Left: View of stream Top Left: Typical view of Bottom Left: View of stre Bottom Right: View of cu	stream downs am as it starts	to transition	1	ım		1	1	2	i î
SCORE	Top Left: Typical view of	stream downs am as it starts	to transition	1	ım		1	12.3		

		Stre				Form for use in Virg	) (For	m 1)			
				wadeable chan	nels classified a	s intermittent or	perennial		Impact/SAR	Impact	
Project #		Project Name	•	Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A		2RVA - Area		VA	R2SB	02070011	10/13/15				
	e(s) of Evaluat	. ,	Stream Nam	e and Informa	ation	02 CT	D OOL				
	dnik, W. Moo		Contraction of	1			R-89b				
. Channel C	Condition: Asse			C	Conditional Catego	ry	_		_		
	Opti	imal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
		W W	Slightly incised, fu	ew areas of active		less than Severe or stable than Severe	Overwident Vertically/laterally		Deeply incised	(or excavated)	
Channel Condition	tion  Vegetative vegetative protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches, Mid-channel bars, and transverse bars few. Transient services the president services are to provide vegetative protection or natural rock prominent (60-80%) AND/OR prominent (60-80%) AND/OR stability. The bankfull and low flow stability. The bankfull and low flow table with the providence of the providenc				Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes, esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be isient, contribute on that contribute to forming/present.	widen further. Majare near vertical. E 60-80% of banl protection preset banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrit AND/OR V-shape	rosion present on ks. Vegetative nt on 20-40% of fficient to prevent & 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sk Erosion/raw ban AND/OR Aggradin	stability. Severe tained within the dd below average lajority of banks ut. Vegetative in less than 20% of venting erosion. bughing present. ks on 80-100%.	
		sediment deposition covers less than 10% of bottom. portions of the reach. Transient sediment covers 10-40% of the stream bottom.				ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depos	ks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1		2.0
NOTES>>	N BULLEDO.					06-STR-05-2	••				
. KIPAKIAI	N BUFFERS: F	Assess both bank				ugh measuremen	ts of length & widt	h may be accep			
. RIPARIAI			Con	ditional Cate	gory				NOTES>>		
Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree		gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation,	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.				
Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti  Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wellands eriparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or or other comparable conditions.			
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#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Date Data Point SAR length Impact Factor Project # R2SB 02070011 10/13/2015 02-STR-89b 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> Conditional Category Moderate embankments, spoil piles, constrictions, livestock Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach is disrupted by any of the channel alterations listed in stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. SCORE 1.5 0.5 1.3 1.1 0.9 0.7 1.30

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: Typical view of stream Top Right: Typical view upstream Bottom Left: View of turn in stream

Bottom Left: View downstream from photo above (Top Right)

NC DWQ Stream Identification Form Version 4.11

02-STR-89

Date: October 13, 2015	Project/Site: DC2RVA - Area 02	Latitude: 38.38414996
Evaluator: J. Budnik, W. Moorhead	County: Stafford	Longitude: -77.39029300
Total Points: 34 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle ene) Ephemeral Intermittent (Perennial)	Other e.g. Quad Name:

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o. 35 of manua	al.		
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	+			perennial	intermittent or p	nels classified as	fied Stream N n wadeable chan				
	Impact Factor	Impact/SAR length	SAR#	Date	HUC	Cowardin Class.	Locality		Project Name	F	Project #
				08/11/2016	02070011	R2SB	VA		2RVA - Area	_	N/A
				rp_an	02-S1	tion	and Informa	Stream Name		e(s) of Evaluate gering, R. Pe	
				111-90		dition (erosion, ago	nd prevailing cond	on of the stream a		ondition: Asses	
	ere	Sev	or	Po	у	Conditional Categor				Optio	
	5	1	5	1		1		77	L L	-	
CI	stability. Severe talaned within the d below average ajority of banks egetative protection n 20% of banks, is ion. Obvious bank Erosion/raw banks o/OR Aggrading nan 80% of stream by deposition, stability. Multiple d/or subterranean	Deeply incised ( vertical/lateral ins  incision, flow cont  banks. Streamber  rooting depth,  wertical/undercut. Ve  present on less than  not preventing erosi  sloughing present.  on 80-100%. ANC  channel. Greater the  bed is covered  contributing to ins  thread channels an	unstable. Likely to iority of both banks osion present on 60- getative protection & of banks, and is nt erosion. AND/OR eam is covered by Sediment is and baility. AND/OR V- thave vegetative nt on > 40% of the diment deposition is	Overwiden Vertically/laterally in widen further. Maj are near vertical. En 80% of banks. Veg present on 20-40% insufficient to prever 60-80% of the stre sediment. S temporary/transic contributing to insta shaped channels protection is preser banks and stable sec abse	stable than Severe wer bank slopes. seent on 40-60% of tive protection on 40-forman seen seen seen seen seen seen seen se	Often incised, but I Poor. Banks more : or Poor due to lot Erosion may be pre both banks. Vegetat 60% of banks. Si bevertical or unde 60% of stream is co Sediment may be te contribute instability contribute to st forming/present. A channels have vege > 40% of the bank features which con	tion or natural rock 80%) AND/OR ures contribute to hkfull and low flow efined. Stream likely nkfull benches, or floodplains along each. Transient 0-40% of the stream	erosion or unprotect of banks are st Vegetative protect prominent (60-Depositional feat stability. The bar channels are well de has access to bar newly developed	Vegetative surface al rock, prominent /OR Stable point ches are present. ginal floodplain or e bankfull benches. and transverse bars diment deposition	Very little incision or 100% stable banks. protection or natura (80-100%). AND/ bars/bankfull benc Access to their orig fully developed wide Mid-channel bars, ar few. Transient sed covers less than	Channel Condition
2.0		1	.6	1.	2	2	.4	2	}	3	Score
	e area	NOTES>>The						·	ssess both bank's	BUFFERS: As	NOTES>>
		adjacent to th		Po	jinal	Marg	ptimal		mal	Optii	
	regetation. nvegetated	primarily oper herbaceous v Some bare/ur areas area als	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Non-maintained, dense herbaceous vegetation, riparian areas lacking shruch and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover ne containing both herbaceous and shrub layers or a non-maintained understory.	anopy cover and a derstory. Wetlands	Tree stratum (dbh > with > 60% tree cai non-mainfained und located within the	Riparian Buffers
			Low	High	Low	High	Low	High	-	4.1	Condition
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								50% 0.85	50% 1.5	% Riparian Area>	Right Bank
			100%					0.00	1.0	ocute >	
	cores*0.01)/2	CI= (Sum % RA * Sc								% Riparian Area>	Left Bank
CI 118	1.18	Rt Bank CI >						50% 0.85	50% 1.5	Score >	Leit Dank
CI 1.18		Rt Bank CI >	100%	ow embededness:	stable substrate: l	and leafy debris:	and depths; woody	0.85	1.5	Score >	
	1.18	Rt Bank CI >	100%	ow embededness;	stable substrate; l			0.85	1.5 ried substrate size	Score >  1 HABITAT: Vari	. INSTREAM
	1.18	Rt Bank CI >	100%	ow embededness;		and leafy debris;		0.85 es, water velocity a features.	1.5 ried substrate size complexes, stable	I HABITAT: Vari	. INSTREAM
	1.18	Rt Bank CI >	100% ; shade; undercut por listed above are ristable. Habitat ally present in less	Ро	pinal nents are typically of the reach and are naintenance of	al Category	Conditiona ptimal ments are typically of the reach and are naintenance of	0.85 es, water velocity a features.  Subol Stable habitat eler present in 30-50% of	1.5 ried substrate size complexes, stable mal re typically present	I HABITAT: Vari	s. INSTREAM anks; root mats;

Project & Applicant Locality Class (2007) 100   Date Project   SAR langth by the part of part		S	tream Ir	npact A	ssessm	nent For	m Page	2		
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock    Channel Alteration   Negligible   Minor   Moderate   Severe   Moderate   M	Project #								SAR length	Impact Factor
Channel Alteration  Channel Alteration  Channel Channe		CSX			R2SB	02070011	08/11/2016	02-STR-90		
Channel Alteration  Channel Alteration  Channel Channe	4. CHANNEI	L ALTERATION: Stream crossin	ngs, riprap, concre	te, gabions, or co	ncrete blocks, stra	ightening of chan	nel, channelization	, embankments,	NOTES>>	
Channel Alteration   Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.   Channel guidelines.   Channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Comparation of the channel attentions listed in the parameter guidelines.   Compara	spoil piles, const	trictions, livestock		Condition	ol Cotomo					
Channel Alteration  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  SCORE  1.5  1.3  1.1  0.9  0.60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  SCORE  1.5  1.3  1.1  0.9  0.7  0.5  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  Alteration  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Less than 20% of the channel is distrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  SCORE  1.5  1.3  1.1  0.9  0.7  0.5  THE REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  REACH CONDITION INDEX (RCI) >>  RCI= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF		Negligible	Mi			lerate	Sev	vere	-	
SCORE 1.5 1.3 1.1 0.9 0.7 0.5  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF		Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	Greater than 80% of by any of the channing the parameter grown of banks sh	of reach is disrupted nel alterations listed uidelines AND/OR ored with gabion,		
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	SCORE	1.5	1.3	1.1			0	.5		
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF		REACH	CONDITION	INDEX and S	TREAM COI	NDITION UN	ITS FOR THIS	S REACH		
RCI= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	NOTE: The Cls and F								CONDITION IN	NDEX (RCI) >>
CR = RCI X LF X IF							-			
										MENT (CR) >>
INSERT PHOTOS:								CR = RC	I X LF X IF	
l I										
DESCRIBE PROPOSED IMPACT:	DESCRIBE F	PROPOSED IMPACT:								

1

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 08/11/2016

02-STR-90

Latitude: 38.383875

valuator: L. Postaski, R. Porath	County: Stafford	d	Longitude: -77	.389958
tream is at least intermittent ≥ 19 or perennial if ≥ 30*		nation (circle one rmitten Perenni		
a. Geomorphology (Subtotal = 13.5	Absent	Weak	Moderate	Strong
a. Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	(1)	2	3
. In-channel structure: ex. riffle-pool, step-pool,	0	1		3
ripple-pool sequence			2	
. Particle size of stream substrate	0	1	2	3
. Active/relict floodplain	0	<u> </u>	2	3
. Depositional bars or benches	0		2	3
. Recent alluvial deposits	0	<u> </u>	2	3
. Headcuts	0	<u> </u>	2	3
. Grade control	0	0.5	1	1.5
0. Natural valley	0	0.5	1	1.5
Second or greater order channel	No.	0 = 0	Yes :	= 3
artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = $\frac{7.5}{1.5}$ )				
2. Presence of Baseflow	0	1	2	3
3. Iron oxidizing bacteria	0	1	2	3
4. Leaf litter	(1.5)	1	0.5	0
5. Sediment on plants or debris	0	0.5	1	1.5
6. Organic debris lines or piles	0	0.5	1	1.5
7. Soil-based evidence of high water table?	No	0 = 0	Yes :	= 3
C. Biology (Subtotal = 9.25)				
8. Fibrous roots in streambed	3	2	1	0
9. Rooted upland plants in streambed	3	2	1	0
Macrobenthos (note diversity and abundance)	0	1	2	3
1. Aquatic Mollusks	0	1	2	3
2. Fish	0	0.5	1	1.5
3. Crayfish	0	0.5	1	1.5
4. Amphibians	0	0.5		1.5
5. Algae	0	0.5	1	1.5
o. rugac		EACIN 0.75	OBL = 1.5 Other = 0	1
6. Wetland plants in streambed		(FACVV = 0.75,)		,
	s. See p. 35 of manua		DBL = 1.5 Other = 0	<u> </u>

		Stre					(For	m 1)			
				fied Stream N wadeable chan							
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	02	VA	R4SB	02070011	10/14/2015				
	e(s) of Evaluat	. ,	Stream Nam	e and Informa	ation						
	dnik, W. Moo					02-S	TR-91				
Channel C	Condition: Asse	ss the cross-sec	tion of the stream		ondition (erosion,						
	Opti	mal	Subo	ptimal		ginal	Po	or	Sev	ere	
	1	NAME OF THE PROPERTY OF THE PR	Slightly incised, fr	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally u		Deaply instead	(or excavated),	
Channel Condition	Very little incision or 100% stable ban surface protection prominent (80-10 Stable point bars% are present. Acces floodplain or fully bankfull benches. I and transverse ba	ks. Vegetative or natural rock, 10%). AND/OR pankfull benches as to their original developed wide Mid-channel bars,	erosion or unproted of banks are stylegetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to rnewly develope	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, d floodplains along	Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Set temporary/tran instability. Depositiv.	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Major are near vertical. E 60-80% of banh protection preser banks, and is insul erosion. AND/OF stream is covere Sediment is temporature, and contrib AND/OR V-shape	rosion present on as. Vegetative on 20-40% of fficient to prevent a 60-80% of the do by sediment. Orary/transient in uting to instability.	vertical/lateral in incision, flow cor banks. Streamble rooting depth, n vertical/underc protection present banks, is not pre Obvious banks lerosion/raw bar	stability. Severe tatained within the ed below average anjority of banks tut. Vegetative on less than 20% of eventing erosion. bughing present. tiks on 80-100%.	
	sediment deposition 10% of b		portions of the reach. Transient sediment covers 10-40% of the stream bottom.  Stream bottom.  stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.				vegetative protection 40% of the band sediment depos	on is present on > ks and stable		channels and/or	CI
Score	3			4	:	2	1.	6		I	2.0
NOTES>>	A DIJECTOR.		d- 400 f4 -ii-			06-STR-06.	5 1   1   0   1	h h	4-h-l-\		
KIPAKIAI	N BUFFERS: A	ssess both bank		ditional Cate		ugn measuremen	ts of length & widt		NOTES>>		
	Opti	mal		ptimal		ginal	Po		Recieves he	eavy	
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	nopy cover and a erstory. Wetlands	to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	herbicide of and channe		
			High	Low	High	understory.	High	Low			
Condition	1.5	5	1.2	1.1	0.85	0.75	0.6	0.5	1		
scriptors. Determine so	arian areas along e quare footage for ea Riparian Area and	ach stream ban ach by measurin Score for each ri	k into Condition C	Categories and Co	I ondition Scores us Calculators are pr	sing the	Ensure the of % Ri	ne sums iparian qual 100			
Right Bank	% Riparian Area>	100% 0.5						100%			
	% Riparian Area>	75%	25%					100%	CI= (Sum % RA * S Rt Bank CI >	cores*0.01)/2 0.50	CI
Left Bank	% Riparian Area>	1.2	0.75					100 /0	Lt Bank CI >	1.09	0.79
	M HABITAT: Va				ody and leafy deb	oris; stable substr	ate; low embeded	ness; shade;	NOTES>>		
dercut banks:	1 2, 2 , 10	,		Conditiona	l Category						
				maine al	Mar	ginal	Po	or	1		
Instream Habitat/	Opti			ments are typically	Stable habitat ele	ments are typically	Habitat elements	listed above are			
Instream	Option  Habitat elements are in greater than 50	e typically present	Stable habitat ele present in 30-50% are adequate fo	•	Stable habitat ele present in 10-30% are adequate fo			listed above are stable. Habitat ally present in less			CI

	St	ream In	npact A	ssessm	ent Fo	rm Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	csx	VA	R4SB	02070011	10/14/2015	02-STR-91			
	L ALTERATION: Stream cross poil piles, constrictions, livestock	sings, riprap, conc		concrete blocks,	straightening of cl	hannel, channeliz	ation,	NOTES>> Right bank ballast. Left	
	Negligible Mir		nor Moderate		Severe		steep cut sl		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter DR 80% of banks bion, riprap, or	Herbicide is applied with sparse vege	often n mostly
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5		
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:



Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

**Date:** October 14, 2015

02-STR-91

Latitude: 38.380767

Evaluator: J. Budnik, W. Moorhead	County: Staffor	d	Longitude: -77	7.394539
<b>Total Points:</b> 26 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		ination (circle one) ermitten Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 9.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	11	2	(3)
Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	$\bigcirc$	2	3
Particle size of stream substrate	٥	1	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	0		2	3
7. Recent alluvial deposits	0	7	2	3
8. Headcuts	0	7	2	3
9. Grade control		0.5	1	(1.5)
10. Natural valley	(0)	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = <u>5.5</u> )				
12. Presence of Baseflow	0	1	<b>(</b> 2 <b>)</b>	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes	= 3
C. Biology (Subtotal = 11 )				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	)-	2	3
22. Fish		0.5	1	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	$\bigcirc$	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	)
*perennial streams may also be identified using other method				
Notes: Railroad ROW ditch with base flow and hy		on in water sections	s. Appears to ha	ave
groundwater connection. Field Sheet 06-S	TR-06.			
Sketch:				
- C.				

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Impact Cowardin Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A ۷A 02070011 10/14/2015 DC2RVA - Area 02 R6 1 Stream Name and Information 02-STR-92 D. Mitchell, M. Rockwell 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) NOTES>> **Conditional Category** Optimal Marginal Adjacent to railroad Low Marginal: Non-maintained, lense herbaceou High Poor: awns, mowed berm. Field Sheet 06ow Subontima ligh Suboptima High Marginal: Non-maintained, STR-12 Team 2. Low Poor: and maintained vegetation, riparian areas acking shrub and with tree stratum with tree stratum areas, nurseries Impervious (dbh > 3 inches) ense herbaceou (dbh > 3 inches) present, with 30% to 60% tree surfaces, mine spoil lands, no-till cropland present, with 30% tree canop vegetation with either a shrub Tree stratum (dbh > 3 inches) presen with > 60% tree canopy cover and ar actively grazed Riparian tree stratum, hav enuded surface roduction, ponds open water. If present, tree pasture, sparsely cover and a laver or a tree **Buffers** canopy cover an vegetated non-maintained area, recently seeded and stabilized, or n-maintained understory. Wetland row crops, active layer (dbh > 3 inches) present, with <30% tree maintained eed lots, trails, or other comparable understory. Recent cutover herbaceous and shrub layers or a stratum (dbh >3 conditions inches) present, with <30% tree (dense canopy cover. non-maintained other comparable condition. vegetation). understory. canopy cover with maintained High Low High High Low Low Condition 0.85 0.75 0.5 1.1 Scores . Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.1 CI= (Sum % RA \* Scores\*0.01)/2 100% 100% Rt Bank CI > CI 1.10 % Riparian Area> Left Bank Score > 0.75 Lt Bank CI > 0.75 0.93

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

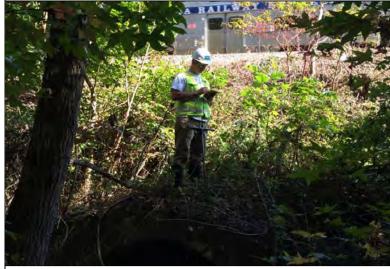
THE REACH CONDITION INDEX (RCI) >> 0.47

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

### INSERT PHOTOS:



NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

Typical view of stream

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 10/14/2015

02-STR-92

**Latitde:** 38.373423

Evaluator: D. Mitchell, M. Rockwell	County: Staffor	d	Longitude: -77	.398990
Total Points: 18 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 3	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
<ol> <li>In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence</li> </ol>	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes :	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 5.5)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	15	$\overline{1}$	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	Ö	0.5	1	1.5
17. Soil-based evidence of high water table?		o = 0	Yes :	
C. Biology (Subtotal = <u>9.5</u> )				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	<u>(1)</u>	2	3
21. Aquatic Mollusks	6	1	2	3
22. Fish		0.5	1	1.5
23. Crayfish		0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.76; OB		
*perennial streams may also be identified using other method	ods. See p. 35 of manua		2 110 9.1101 = 0	<u> </u>
Notes: Adjacent to railroad berm. Field Sheet 06		***		
Sketch: ttt ttt tt	111			
	Street	am Channel		
Rail Road B	Berm			

	Ephe	mera	I Stre	fied Stream I	Methodology 1	for use in Virg		(For	m 1a)	
Project #	ı	Project Name	e	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC	2RVA - Area		VA	R6	02070011	10/14/2015		g	1
	e(s) of Evalua itchell, M. Roc		Stream Nam	e and Inform	ation	02-87	ΓR-93			
D. IVII	iterien, ivi. ivoc	RWEII				02-3	I K-93			
. RIPARIAN	N BUFFERS: A	Assess both bank				ugh measuremen	ts of length & wid	Ith may be accep		
	Opti	mal		nditional Cate	<del></del>	ginal	Po	oor	NOTES>> Field Sheet	06-STR-13
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca non-maintained unc are	nopy cover and an derstory. Wetlands		Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, tally or other comparable conditions.	•	
Condition			High	Low	High	Low	High	Low		
Scores	1.		1.2	1.1	0.85	0.75	0.6	0.5		
descriptors. 2. Determine squelow.	quare footage for e Riparian Area and % Riparian Area>	sach by measuring Score for each results 100%	ng or estimating le	ength and width.	Calculators are p	-	of % F	Riparian equal 100 100%	-	
	Score >	1.2							CI= (Sum % RA * S	cores*0.01)/2
Left Bank	% Riparian Area>	100% 1.2						100%	Rt Bank CI >	1.20 1.20
			ONDITION	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH	2. 24	
OTE: The CIs and F	RCI should be rounded								CONDITION IND	EX (RCI) >>
									CI= (Riparian CI)	
									ION REQUIREM	ENT (CR) >>
DESCRIBE F	PROPOSED IN	IPACT:								

NC DWQ Stream Identification Form Version 4.11

02-STR-93

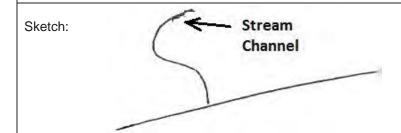
Date: 10/14/2015	Project/Site: DC2RVA - Area 02	Latitde: 38.370851
Evaluator: D. Mitchell, M. Rockwell	County: Stafford	Longitude: -77.400149
<b>Total Points:</b> 14.25 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

ii ≥ 19 0i pererimarii ≥ 30				
A. Geomorphology (Subtotal = 4)	Absent	Weak	Moderate	Strong
1 <sup>a</sup> Continuity of channel bed and bank	0	(1)	2	3
Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	8	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0)	1	2	3
8. Headcuts	0	1	2	3
9. Grade control		0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $4.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
C. Biology (Subtotal = $\underline{5.75}$ )				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	(0)	7	2	3

20. Macrobenthos (note diversity and abundance) 1 2 3 21. Aquatic Mollusks 22. Fish 0.5 1.5 1 23. Crayfish 0.5 1 1.5 24. Amphibians 0.5 1 1.5 0 25. Algae 0.5 1.5 FACW = 0.75; OBL = 1.5 Other = 0 26. Wetland plants in streambed

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet 06-STR-13 Team 2.



Project # Project Name   Locality Covering   HUC   Date   SAR #   Impact						Methodology 1	for use in Vir	ginia			
Name(s) of Evaluator(s)  D. Mitchell, M. Rockwell  Optimal Suboptimal registrations are seen as a company of the company of th	Project #		Project Name	e		Cowardin		Date	SAR#		
2. RIPARIAN BUFFERS: Assess both banks 100 foot oparism areas along the arrivals SAR. (rough measurements of length & width may be acceptable)    Conditional Category   Marginst   Margins							02070011	10/14/2015			1
Popular Suboptimal Suboptimal Warginal Figs Suboptimal Warginal Figs Suboptimal Figs Suboptima				Stream Nam	e and inform	ation	02-S	ΓR-94			
Conditional Category    Suboptimal   Warginal   Poor   Poo											
Condition   Scores   Inches   Subport   Inches	RIPARIAN	N BUFFERS:	Assess both bank				ugh measuremen	ts of length & wid	Ith may be accept		
Riparian Buffers  The distance (dish - 3 inches) present, with some pr		Opt	imal			<del> </del>		Po	oor		06-STR-14
Scores 1.3 1.2 1.1 0.85 0.75 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.		Tree stratum (dbh: with > 60% tree canon-maintained un	> 3 inches) present, anopy cover and an derstory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>-30%</a> tree canopy cover with maintained understory.	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		
1. Delinear prigrant areas along each aream bank into Condition Categories and Condition Scores using the descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below. 3. Enter the %Riparian Area and Score for each riparian category in the blocks below.  Right Bank Score > 1.2  Left Bank WR Right Areas		1	.5	1.2	1.1	0.85	0.75	0.6	0.5		
Right Bank   Score > 1.2	. Delineate ripa escriptors. . Determine sq elow.	uare footage for	each by measurir	ng or estimating le	ength and width.	Calculators are p	•	of % F	Riparian		
Right Bank Score > 1.2   Cle (Sum % RA* Scores*0.01)/2  Left Bank   % Rigarian Area> 100%   Rt Bank Cl>   1.20    REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCl) >> RCl (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >> CR = RCl X LF X IF  NSERT PHOTOS:				nparian category i	n the blocks belo	w.		Blocks e			
Left Bank Sorre 1.2 Lt Bank CI > 1.20  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  OTE: The Cis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  NSERT PHOTOS:	Right Bank								10070		
Lit Bank Ci > 1.2   Lit Bank Ci > 1.20		% Pinarian Areas	100%						100%		
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  SERT PHOTOS:	Left Bank	•							100%		
RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF   NSERT PHOTOS:			REACH C	ONDITION I	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH		
COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  NSERT PHOTOS:	OTE: The CIs and F	RCI should be rounded	d to 2 decimal places	. The CR should be ro	unded to a whole nun	nber.			THE REACH O	ONDITION IND	EX (RCI) >>
NSERT PHOTOS:											
NSERT PHOTOS:											ENT (CR) >>
DESCRIBE PROPOSED IMPACT:											

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 10/14/2015

02-STR-94

**Latitde:** 38.367655

County: Stafford Stream Determi Ephemeral Inte	nation (circle one)	Longitude: -77 Other	.401763	
Stream Determi Ephemeral Inte	nation (circle one)	Other		
Ephemeral Inte	ermittent Perennial	Other		
		l oigi quad i umoi		
Absent	Weak	Moderate	Strong	
0	(1)	2	3	
0	(1)	2	3	
0	1	2	3	
0	(1)	2	3	
0	1	2	3	
(0)	1	2	3	
0	1	2	3	
0	(1)	2	3	
0	0.5	1	1.5	
0	0.5	1	1.5	
No	o = 0	Yes =	= 3	
	T			
0	1	2	3	
<u>(0)</u>	1	2	3	
(1.5)	1	0.5	0	
0	0.5	1	1.5	
0	0.5	1	1.5	
No	0 = 0	Yes =	= 3	
(3)	2	1	0	
(3)	2	1	0	
	1	2	3	
	1	2	3	
0	0.5	1	1.5	
	0.5	1	1.5	
0	0.5	1	1.5	
0	0.5	1	1.5	
	FACW = 0.75; OB	L = 1. Other = 0		
See p. 35 of manua	al.			
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 0 0	0 1 2 0 1 2 0 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 0 1 2 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Area 02		02	VA	R2SB3	02070011	10/14/2015		lengui	1 actor	
Nam	ne(s) of Evaluator(s)		Stream Nam	e and Informa	ation						
J. Bu	dnik, W. Mod	orhead				02-ST	R-95a				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Optimal		Subo	ptimal	onditional Catego	ry ginal	Po	or	Sev	ere	
	The state of the s		1	~		less than Severe or	Overwiden		1	5	
Channel Condition			Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along or newly developed floodplains along		or Poor due to lo Erosion may be pri both banks. Veget 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe wer bank slopes. essent on 40-60% of tative protection on Streambanks may errut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetatiwe protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability.		Deeply incised vertical/lateral in incision, flow cor banks. Streambe rooting depth, rr vertical/lunderc protection present of banks, is not pre Obvious bank sk Erosion/raw ban AND/OR Aggradin.	stability. Severe tained within the de below average hajority of banks ut. Vegetative on less than 20% of vventing erosion. Dughing present. ks on 80-100%.	
		and transverse dars few. Transient addiment deposition covers less than 10% of bottom.  Transient sediment deposition covers less than 10% of bottom.  stream bottom.  stability, may be forming/present.  AND/OR V-shaped channels have vegetative protection on > 40% of the banks and stable sediment deposition is present on > 40% of the banks and depositional features which contribute to stability.		than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	С					
Score	3	3	2	.4		2	1.	6	1	ı	3.0
2. RIPARIAI	I BIIEEEDS: /										
_ III AIVAI			Con	ditional Cate	gory		ts of length & wid		NOTES>>		
Riparian Buffers	Opti	imal  > 3 inches) present, anderstory. Wetlands	Con		gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a>30%</a> tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, other comparable condition.		,		
Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cu. non-maintained un	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	,		
Riparian	Opti Tree stratum (dbh: with > 60% tree canon-maintained unlocated within th	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails other coringarable conditions.	,		
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of t	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Congth and width. (dense and congth and width. (dense and congth and congth and congth and width. (dense and congth and congth and width. (dense and congth and width. (dense and congth	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	,		
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree conon-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Congth and width. (dense and congth and width. (dense and congth and congth and congth and width. (dense and congth and congth and width. (dense and congth and width. (dense and congth	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	,		
Riparian Buffers  Condition Scores  Delineate rip elescriptors. Delineate rip scores  Enter the %	Tree stratum (dbh: with > 60% tree cz non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  75%  1.5	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.6	ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Congth and width. (dense and congth and width. (dense and congth and congth and congth and width. (dense and congth and congth and width. (dense and congth and width. (dense and congth	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * S		-
Riparian Buffers  Condition Scores  Delineate rip elescriptors. Delineate rip scores  Enter the %	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strain areas along quare footage for exparian Area and % Riparian Area>	imal  > 3 inches) present, anopy cover and a destory. Wetlands e riparian areas.  .5  each stream ban each by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25%	ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Congth and width. (dense and congth and width. (dense and congth and congth and congth and width. (dense and congth and congth and width. (dense and congth and width. (dense and congth	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>	cores*0.01)/2 1.28	CI 1.2
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree conon-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score > % Riparian Area> Score > W HABITAT: Vi	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 75% 1.5  75% 1.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Kinto Condition C g or estimating le parian category in 25% 0.6  25% 0.6	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Academic Scores us Calculators are proven.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	1.28	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the %  Right Bank  Left Bank  1. INSTREAl undercut banks;	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5  each stream ban each by measurin 75% 1.5  75% 1.5  aried substrate si iffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.6  25% 0.6  zes, water velocit exes, stable feature	ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  ategories and Congth and width. Congth and width. Congth blocks below  y and depths; wores.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are prov.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >  Lt Bank CI >	1.28	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 75% 1.5  75% 1.5  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.6  25% 0.6  25% 0.6  zes, water velocit exes, stable featur	ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  ategories and Coungth and width. Coungth and width. Coungth and depths; wores. Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the control of the con	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  priss; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >  Lt Bank CI >	1.28	
Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree canon-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  W HABITAT: Viroot mats; SAV; r	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5  each stream ban each by measurin 75% 1.5  75% 1.5  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.6  25% 0.6  zes, water velocit exes, stable featur  Subo  Stable habitat elpresent in 30-50%	ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  ategories and Congth and width. Congth and width. Congth blocks below  y and depths; wores.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Acalculators are proved and leafy detection of the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks end Blo	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >  Lt Bank CI >	1.28	1.2
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cr non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Vi root mats; SAV; r  Opti Habitat elements a in greater than 5	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5  each stream ban each by measurin 75% 1.5  75% 1.5  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  K into Condition C g or estimating le parian category in 25% 0.6  25% 0.6  Zes, water velocit exes, stable featur  Subo Stable habitat ele present in 30-50y are adequate fo popul	ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  ategories and Congth and width. Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditional ptimal ments are typically 6 of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are prov.  I Category  Marry  Stable habitat ele present in 10-30% are adequate fo popul	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you  ginal ments are typically & of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks end  Habitat elements lacking or are ur	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel folist, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%  100%	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >  Lt Bank CI >	1.28	

	St	ream Im	pact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB3	02070011	10/14/2015	02-STR-95a		
	ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, conc	rete, gabions, or		straightening of ch	hannel, channeliz		NOTES>> Right bank ballast left l	
	Negligible Mir		nor Moderate		erate	Severe		cut slope ar	•
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter DR 80% of banks bion, riprap, or	herbicided sparse vego	with mostly
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5		
	REACH C	ONDITION IN	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

### INSERT PHOTOS:



NC DWO Stream Identification Form Version 4.11

02-STR-95a

Date: October 14, 2015	Project/Site: DC2RVA - Area 02	Latitude: 38.361681					
Evaluator: J. Budnik, W. Moorhead	County: Stafford	Longitude: -77.404383					
<b>Total Points:</b> 47.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:					

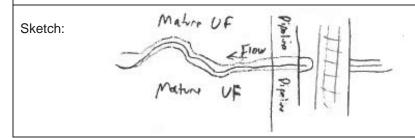
II ≥ 19 or perennar II ≥ 30				
A Coomarphalagy (Subtotal 215	Absent	Weak	Moderate	Strong
A. Geomorphology (Subtotal = 21.5		vveak	Woderate	Stibilg
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	Ŷ	(2)	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5	1	<b>(</b> 1.5 <b>)</b>
11. Second or greater order channel	No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $10.5$ )				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
				1

12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	N	lo = 0	Yes	= 3
C Diology (Cubtotal 15.5				

C. Biology (Subtotal = <u>15.5</u> )				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	(3)
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5		1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: This is a good quality stream, good flow. Water beetles and water striders present. Field Sheet 06-STR-07.



		Stre					(For	m 1)			
				fied Stream N wadeable chan							
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Area 02		02	VA	R2SB	02070011	10/14/2015		_		
	e(s) of Evaluat		Stream Nam	e and Informa	ation						
	tchell, M. Roc					02-ST	R-95b				
. Channel C	Condition: Asse	ss the cross-sec	tion of the stream		ondition (erosion, onditional Categor						
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	vere	
	"Luke	ALLAND OF THE STATE OF THE STAT	Slightly incised, fr	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally u		Deanly incised	(or excavated),	
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-10 Stable point bars/t are present. Acces floodplain or fully bankfull benches.	iks. Vegetative or natural rock, 00%). AND/OR bankfull benches as to their original developed wide Mid-channel bars,	erosion or unproted of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to htfull and low flow II defined. Stream o bankfull benches, d floodplains along	Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sed temporary/tran	wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Major are near vertical. E 60-80% of bank protection preser banks, and is insul erosion. AND/OF stream is covere Sediment is tempor nature, and contrib	rosion present on as. Vegetative on 20-40% of fficient to prevent a 60-80% of the d by sediment.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, n vertical/underc protection present banks, is not pre	stability. Severe tatained within the ad below average najority of banks sut. Vegetative on less than 20% of eventing erosion. Dughing present.	
	and transverse ba sediment deposition 10% of b	covers less than	portions of the r sediment cover	each. Transient s 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the onal features which to stability.	AND/OR V-shape vegetative protectic 40% of the ban sediment depos	on is present on > ks and stable	AND/OR Aggradin	g channel. Greater n bed is covered by outing to instability. channels and/or	С
Score	3		2	.4		2	1.	6			2.4
NOTES>>	N BUFFERS: A	ssess both bank	c's 100 foot riparia			STR-15 Tea		h may he accer	stable)		
				ditional Cate		<u></u>	to or longer a mar	ay 20 accep	NOTES>>		
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or			
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	nopy cover and a erstory. Wetlands	to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree carpoy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
			High	Low	High	Low	High	Low			
					-				1		
Condition Scores	1.5	5	1.2	1.1	0.85	0.75	0.6	0.5			
Scores  Delineate ripelescriptors. Determine scielow.	1.sarian areas along equare footage for ea	each stream ban	k into Condition C	categories and Co	I ondition Scores us Calculators are pr	sing the	0.6  Ensure the of % Ri Blocks ed	ne sums iparian			
Scores  Delineate ripidescriptors. Determine scielow. Enter the % I	varian areas along e	each stream ban	k into Condition C	categories and Co	I ondition Scores us Calculators are pr	sing the	Ensure the	ne sums iparian			
Scores  Delineate ripiescriptors. Determine scielow. Enter the % I	parian areas along e quare footage for ea Riparian Area and % Riparian Area>	each stream ban ach by measurin Score for each r 100%	k into Condition C	categories and Co	I ondition Scores us Calculators are pr	sing the	Ensure the	ne sums iparian qual 100	CI= (Sum % RA * S	cores*0.01)/2	
Scores  Delineate ripidescriptors. Determine scielow. Enter the % I	arian areas along e quare footage for ea Riparian Area and : % Riparian Area > Score >	each stream ban ach by measurin Score for each r 100% 1.1	k into Condition C	categories and Co	I ondition Scores us Calculators are pr	sing the	Ensure the	ne sums iparian qual 100	Rt Bank CI >	1.10	CI
Scores  Delineate rip: escriptors. Determine scelow. Enter the % I  Right Bank  Left Bank	arian areas along e quare footage for ea Riparian Area and 1 % Riparian Area> Score >	each stream ban ach by measurin Score for each r 100% 1.1 100% 1.1	k into Condition C g or estimating le iparian category in	ategories and Co	ondition Scores us Calculators are prov.	ovided for you	Ensure the of % Ri Blocks ec	parian qual 100 100%			CI 1.1
Scores  Delineate rip: lescriptors. Determine scelebw. Enter the % I Right Bank  Left Bank  Left Bank  INSTREAI	arian areas along e quare footage for ea Riparian Area and 1 % Riparian Area> Score >	each stream ban ach by measurin Score for each r 100% 1.1 100% 1.1 ried substrate si	k into Condition C g or estimating le iparian category in	ategories and Congth and width. On the blocks below	ondition Scores us Calculators are prov.	ovided for you	Ensure the of % Ri Blocks ec	parian qual 100 100%	Rt Bank CI >	1.10	
Scores  Delineate ripitescriptors. Determine scielow. Enter the % I Right Bank  Left Bank  INSTREAI	arian areas along e quare footage for e Riparian Area and :  % Riparian Area > Score >  % Riparian Area> Score >  M Riparian Area> Score >	each stream ban ach by measurin 100% 1.1 100% 1.1 ried substrate si	k into Condition C g or estimating le iparian category in izes, water velocit exes, stable featu	rategories and Congth and width. Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditional	calculators are provided by the condition of the conditio	ovided for you  oris; stable substr	Ensure the of % Ri Blocks en	parian qual 100 100% 100%	Rt Bank CI >	1.10	
Scores  Delineate ripidescriptors. Determine scoledw. Enter the % I  Right Bank  Left Bank  Left Bank  Instream  Habitat/  Available	arian areas along e quare footage for ex Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Va ; root mats; SAV; rii  Optii  Habitat elements ar	ach stream ban ach by measurin 100% 1.1 100% 1.1 ried substrate si ffle poole comple mal	k into Condition C g or estimating le iparian category in izes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	rategories and Congth and width. On the blocks below  by and depths; wo res.  Conditional ptimal ments are typically 6 of the reach and	ondition Scores us Calculators are prov.  ody and leafy det  Il Category  Stable habitat elepresent in 10-309	ovided for you   Ensure the of % Ri Blocks ed	ne sums iparian qual 100 100%  100%  ress; shade;  or  listed above are stable. Habitat	Rt Bank CI > Lt Bank CI >	1.10	1.1	
Scores  Delineate ripitescriptors. Determine scielow. Enter the % I Right Bank  Left Bank  INSTREAI Indercut banks; Instream Habitat/	arian areas along e quare footage for ex Riparian Area and 9 % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Va ; root mats; SAV; rii  Optii	seach stream ban ach by measurin 100% 1.1 100% 1.1 ried substrate si ffle poole comple mal e typically present % of the reach.	g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ategories and Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditional ments are typically	ondition Scores us Calculators are provided in the control of the	ovided for you  ovided for you  ovis; stable substr	Ensure the of % Rise Blocks en Block	ne sums iparian qual 100 100% 100%  100%  iness; shade;  or  listed above are stable. Habitat lily present in less the reach.	Rt Bank CI > Lt Bank CI >	1.10	

	St	ream In	npact A	ssessm	ent For	m Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	csx		VA	R2SB	02070011	10/13/2015 02-STR-95b				
4. CHANNEL	_ ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of ch	nannel, channeliz	ation,	NOTES>>		
embankments, s	poil piles, constrictions, livestock		Conditiona							
	Negligible	Mir	nor		erate	Sev	ere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with ga cem	of the channel in the parameter OR 80% of banks bion, riprap, or			
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5			1.50
	REACH CO	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			
NOTE: The CIs and R	CI should be rounded to 2 decimal places. T	he CR should be roun	ided to a whole number	er.				CONDITION IN		
								I= (Sum of all C		0
						'		I X LF X IF	WENT (CR) >>	0
INSERT PHO	TOS:						JI II.			ı
DESCRIBE F	PROPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11

02-STR-95b

Date: 10/14/2015	Project/Site: DC2RVA - Area 02	Latitde: 38.361934
Evaluator: D. Mitchell, M. Rockwell	County: Stafford	Longitude: -77.404685
<b>Total Points:</b> 35.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 17)	Absent	Weak	Moderate	Strong
1a. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence		ı		
Particle size of stream substrate	0		2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	T	2	3
3. Headcuts	0	1	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	= 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual				
3. Hydrology (Subtotal = 8.5 )				
2. Presence of Baseflow	0	1	2	3
3. Iron oxidizing bacteria	0	(1)	2	3
4. Leaf litter	1.5	$\bigcirc$	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
7. Soil-based evidence of high water table?	No	= 0	Yes:	= 3
C. Biology (Subtotal = 10 )				
8. Fibrous roots in streambed	(3)	2	1	0
9. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
1. Aquatic Mollusks	0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1. Other = 0	
*perennial streams may also be identified using other metho	ds. See p. 35 of manual	l.		
Notes: Field Sheet 06STR-15 Team 2.	*			

Project M Project Name   Coccasion   Coveragin   HUC   Date   SAR M   Impact   Impact   College   Name   Coccasion   Coveragin   HUC   Date   SAR M   Impact   College   Name   Coccasion   Name   N	Project #				fied Stream N	lethodology 1	or use in Virg		(Fori	m 1a)	
NAM DCZRVA - Area 02 VA R 6 02070011 10/14/2015 1 1  Name(s) of Evaluator(s)  J. Budnik, W. Moorhead  O2-STR-96  Z. RIPARIAN BUFFERS: Assess both banks 100 foot oparian areas along the entire SAR. (rough measurements of langth & with may be acceptable)  Conditional Suboptimal rings (suboptimal rings) (suboptimal rin			Project Name	9		Cowardin		Date	SAR#		
Name(g) of Evaluator(g)  J. Budnik, W. Moorhead  Conditional Category  Optimal Subportinal Physics Residuals are seen for the physics of the service of the	•		•		-				Or all w	length	
Conditional Category  Optimal Suboptimal  High Suboptimal							02070011	10/14/2013			<u> </u>
Condition   Suboptimal   Warginal   Suboptimal   Subopt							02-S	TR-96			
Condition   1.5   1.2   1.1   0.85   0.75   0.6   0.5	. RIPARIAI	N BUFFERS:	Assess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	th may be accept	able)	
Riparian Buffers  The drawn lab. 1-1-drawn present, light Suboptimal Projects acrease (fight 3-5 acrease) and light Suboptimal Projects acrease (fight 3-5 acrease) acreas						<del></del>					
Riparian Buffers  Riparian Buf		Opt	imal	Subo		Mar	Low Marginal:		oor	Field Sheet	06-STR-08.
Condition   1.5   1.2   1.1   0.85   0.75   0.6   0.5		with > 60% tree ca non-maintained un	nopy cover and an derstory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches), present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		
Scores	Condition	1	<u> </u>			-		-			
Becipions   Blocks and first   Blocks and first   Blocks   Block										-	
Right Bank Score > 1.5 0.6 Case Score > 1.5 0.6 Case Score > 1.5 Case Scor	escriptors.  Determine so elow.	quare footage for e	each by measurin	ng or estimating le	ngth and width. (	Calculators are pr	•	of % F	Riparian		
Score > 1.5 0.6    Cla (Sum % RA* Score**0.01)/2	Right Bank	% Riparian Area>		75%					100%		
Left Bank    Score > 1.5   Lt Bank Cl > 0.83     Lt Bank Cl > 1.50     REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH   THE REACH CONDITION INDEX (RCI) >> RCIe (Riparian Cl)/2     COMPENSATION REQUIREMENT (CR) >>     CR = RCI X LF X IF	g.ii. Daiik	Score >	1.5	0.6						Cl= (Sum % RA * 9/	cores*0.01\/2
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  RISERT PHOTOS:	Loft Donle	% Riparian Area>	100%						100%	<u> </u>	
The Cis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  ISERT PHOTOS:	Leit Dank	Score >								Lt Bank CI >	1.50
RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF							NDITION UN				
COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  ISERT PHOTOS:	TE: The CIs and	RCI should be rounded	to 2 decimal places.	The CR should be rou	nded to a whole numb	er.					
ISERT PHOTOS:									COMPENSATI	ON REQUIREM	
DESCRIBE PROPOSED IMPACT:	NSERT PHO	DTOS:									
	DESCRIBE I	PROPOSED IN	MPACT:								

**NC DWQ Stream Identification Form Version 4.11** 

02-STR-96

	•	
Date: 10/13/2015	Project/Site: DC2RVA - Area 02	Latitde: 38.386837
Evaluator: D. Mitchell, M. Rockwell	County: Stafford	Longitude: -77.385866
Total Points: 40 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ $30^*$	Epitemerai inte	Tillittoni	e.g. Quad Name.	ı
			_	
A. Geomorphology (Subtotal = 17	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	2	(3)
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	0	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	T	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual	•			
B. Hydrology (Subtotal = $9$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5		1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 14 )	_			
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	Y	1	(2)	3
21. Aquatic Mollusks	0	1	(2)	3
22. Fish	0	0.5		1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
-	<del>-  </del>			

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet 06-STR-08 Team 2.

26. Wetland plants in streambed

Sketch:

FACW = 0.75; OBL = 1.5 Other = 0

		Otic	am A	fied Stream M			_				
		5 N		wadeable chan	nels classified a			242 "	Impact/SAR	Impact	
Project #		Project Name	•	Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A		DC2RVA - Area 02		VA	R2SB3	02070011	10/14/2015				
Nam	ne(s) of Evaluate  K. Astroth	tor(s)	Stream Nam	e and Informa		02 STD	07 (0.4)		-1.		
Channel (		es the cross-sec	tion of the stream	and prevailing of			-97 (Poto	omac Cre	ek)		
. Onamici c	Optimal				onditional Categor		Po	or	Sev	voro.	
	- Opti	IIIai	Subo	pumai	Iviar	giriai	1	OI	Jan Sev	ere //	
	"	WAR.	1			ess than Severe or	Overwidene		1	5	
Channel Condition	Very little incision of 100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully bankfull benches.	n or natural rock, 00%). AND/OR bankfull benches ass to their original developed wide	erosion or unproted of banks are s Vegetative protect prominent (60- Depositional feat stability. The bar channels are we likely has access to	ew areas of active cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches,	or Poor due to lo Erosion may be pre both banks. Vegel 40-60% of banks. bevertical or unde 60% of stream sediment. Sec temporary/trans	esent on 40-60% of ative protection on Streambanks may rcut. AND/OR 40- n is covered by diment may be sient, contribute	Vertically/laterally widen further. Maji are near vertical. E 60-80% of banil protection presei banks, and is insu erosion. AND/OF stream is covere Sediment is temp	ority of both banks rosion present on its. Vegetative on 20-40% of fficient to prevent its 60-80% of the id by sediment.	Deeply incised vertical/lateral in incision, flow cor banks. Streambe rooting depth, rr vertical/underc protection present or banks, is not pre Obvious bank sla	stability. Severe stained within the ad below average sajority of banks ut. Vegetative on less than 20% of eventing erosion.	
	and transverse ba sediment depositio 10% of	ars few. Transient in covers less than	portions of the r sediment cover	d floodplains along reach. Transient rs 10-40% of the bottom.	AND/OR V-shape vegetative protection banks and deposition	on that contribute to forming/present. ed channels have on on > 40% of the onal features which to stability.	nature, and contrib AND/OR V-shape vegetative protectic 40% of the bar sediment depos	d channels have on is present on > ks and stable	Erosion/raw ban AND/OR Aggradin	ks on 80-100%. g channel. Greater bed is covered by uting to instability. channels and/or	c
Score	3	3	2	4	2	2	1.	6	1		2.
NOTES>>	.N BUFFERS: A		's 100 foot riparia		e entire SAR. (rou				table)	8-PC.	
. RIPARIAI	Option  Tree stratum (dbh > with > 60% tree ca	Assess both bank	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy	e entire SAR. (rou  gory  Mary  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub		Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely	Low Poor: Impervious surfaces, mine spoil lands, denuded	table)	OW down	
. RIPARIAI	Option  Tree stratum (dbh > with > 60% tree ca	Assess both bank imal  - 3 inches) present, inopy cover and a ferstory. Wetlands	Con Subo  Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorium Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, orther cornparable conditions.	NOTES>> Pipeline Roto stream,	OW down	
RIPARIAI Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree canon-maintained und located within the	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	an areas along the ditional Categorium Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, righarian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Pipeline Roto stream,	OW down	
. RIPARIAI	Opti  Tree stratum (dbh > with > 60% tree canon-maintained unc	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo  Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorium Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, orther cornparable conditions.	NOTES>> Pipeline Roto stream,	OW down	
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine so	Opti  Tree stratum (dbh > with > 60% tree canon-maintained und located within the	assess both bank  a inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Pipeline Roto stream,	OW down	
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow. Enter the %	Opti  Tree stratum (dbh with > 60% tree canon-maintained undocated within the located within the located of the canon-maintained undocated within the located within	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e ripartian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Kinto Condition Co	an areas along the ditional Categoremal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are prov.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Pipeline Roto stream,	OW down	
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine so	Tree stratum (dbh with 5 60% tree canon-maintained und located within the located within	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e ripartian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition Co g or estimating le parian category in	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are prove.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Pipeline Ro to stream, ATVs.	DW down rough, for	
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % Right Bank	Opti  Tree stratum (dbh with > 60% tree canon-maintained undocated within the located within the located of the canon-maintained undocated within the located within	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e ripartian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Kinto Condition Co	an areas along the ditional Categoremal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are prov.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Pipeline Roto stream,	DW down rough, for	C
Riparian Buffers  Condition Scores Delineate ripescriptors. Determine scelow.	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located within the located reason areas along a quare footage for e Riparian Area and % Riparian Area > Score >	imal  3 inches) present, anopy cover and a ferstory. Wetlands er liparian areas.  5  each stream bani ach by measurin Score for each ri 30% 1.5	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 1.2	an areas along the ditional Categories and Congth and width. Categories and Congth and Congth and C	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are prov. 25% 0.75	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Les sums sparian qual 100 100%	NOTES>> Pipeline Roto stream, ATVs.	DW down rough, for	C 1.1
Riparian Buffers  Condition Scores Delineate rip escriptors. Determine scelow. Enter the % Right Bank  Left Bank	Tree stratum (dbh > with > 60% tree ca non-maintained un located within the located withi	assess both bank  and and and and and and and and and an	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 25% 1.2  25% 1.2  zes, water velocii	an areas along the ditional Categories and congth and width. Categories and Congth and Categories and Congth and Categories and Congth and Categories and Congth and Categories and Categorie	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are present, v.  25%  0.75	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  ing the	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stablized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums imparian qual 100 100%	NOTES>> Pipeline Roto stream, ATVs.  Cl= (Sum % RA * S Rt Bank Cl >	OW down rough, for	
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Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine scelow. Enter the % I Right Bank  Left Bank  Instream Habitat/ Available	Tree stratum (dbh with > 60% tree canon-maintained und located within the located within	Assess both bank  imal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5  each stream bank ach by measurin 30% 1.5  30% 1.5  aried substrate si fflle poole comple imal re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating lee parian category in 25%  1.2  25%  1.2  zes, water velocitiexes, stable features subo-50% subo-	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Acalculators are proved the control of the cont	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the covided for you  priss; stable substr	Its of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R Blocks en  Blocks en  Habitat elements lacking or are ur	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Pipeline R0 to stream, ATVs.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	OW down rough, for	
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### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Date Data Point SAR length Project # Impact Factor R2SB3 02070011 10/14/2015 02-STR-97 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach is disrupted by any of the channel alterations listed in stream reach is the parameter guidelines. If stream has been disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. SCORE 1.5 0.5 1.3 1.1 0.9 0.7 1.30

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:



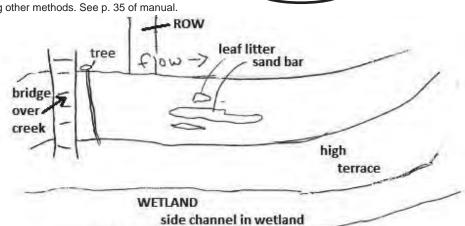
Top Left: View across stream at two-track

Top Right: View downstream Bottom Left: View of stream

# NC DWQ Stream Identification Form Version 4.11 Potomac Creek 02-STR-97

Date: October 14, 2015	Project/Site: DC2RVA - Area 02	<b>Latitude:</b> 38.356949
Evaluator: K. Astroth	County: Stafford	Longitude: -77.407618
<b>Total Points:</b> 42.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Ephemeral Intermittent Perennial e.g. Quad Name:						
A. Geomorphology (Subtotal = 18.5	Absent	Weak	Moderate	Strong			
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)			
2. Sinuosity of channel along thalweg	0	1	2	(3)			
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3			
4. Particle size of stream substrate	0	1	2	3			
5. Active/relict floodplain	0	1	2	3			
6. Depositional bars or benches	0	1	2	3			
7. Recent alluvial deposits	0	(1)	2	3			
8. Headcuts	(0)	$\overline{}$	2	3			
9. Grade control	0	0.5	1	1.5			
10. Natural valley	0	0.5	1	1.5			
11. Second or greater order channel	No	0 = 0	Yes	= 3			
artificial ditches are not rated; see discussions in manual	·						
3. Hydrology (Subtotal = 11 )							
2. Presence of Baseflow	0	1	2	(3)			
13. Iron oxidizing bacteria	0	1	2	3			
14. Leaf litter	1.5	1	0.5	0			
15. Sediment on plants or debris	0	0.5		1.5			
16. Organic debris lines or piles	0	0.5		1.5			
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3)			
C. Biology (Subtotal = <u>13</u> )							
18. Fibrous roots in streambed	3	(2)	1	0			
19. Rooted upland plants in streambed	(3)	2	1	0			
20. Macrobenthos (note diversity and abundance)	Q	1	(2)	3			
21. Aquatic Mollusks	(0)	1	2	3			
22. Fish	9	0.5	1	1.5			
23. Crayfish	0	0.5	1	1.5			
24. Amphibians	0	0.5	1	1.5			
25. Algae	0	0.5		1.5			
26. Wetland plants in streambed		FACW = 0.75	OBL = 1.5 Other = 0	)			
*perennial streams may also be identified using other meth	hods. See p. 35 of manua	al.					
Notes: Potomac Creek (south side).	1	ROW					
Field Sheet 06-SRT-08-PC.		leaf litte	nr.				
Sketch:	- tree flo		nd bar	1			



				fied Stream N						
Project #		Project Name		Locality	Cowardin	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact
•				VA	Class. R4SB3			JAK#	length	Factor
N/A Nam		DC2RVA - Area 02 e(s) of Evaluator(s)		e and Informa		02070011	10/13/2015			
Hulli	L. Eggering	, , ,		- and informe	02-S		ΓR-98			
Channel C	Condition: Asse	ess the cross-sec	tion of the stream			aggradation)				
Optimal			Suboptimal		Conditional Category  Marginal		Poor		Severe	
	Very little incision or active erosion; 80 100% stable banks. Vegetative		Slightly incised, few areas of active		Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute		Overwidened/incised.  Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in		Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%.	
Channel Condition										
			Sueam bottom.		banks and depositional features which contribute to stability.		sediment deposition is absent.		Multiple thread channels and/or subterranean flow.	
Score	3	3	2	.4	:	2	1.	6	1	
		incisc	ea miermili	ent stream	is upland t	orest. Field	d Sheet 06-	SRT-07-Le	eland.	_
. RIPARIAI	N BUFFERS: A	Assess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep	table)	
. RIPARIAI	N BUFFERS: /	Assess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep	notes>> Mature upl	
RIPARIAI Riparian Buffers	Opti	Assess both bank imal  > 3 inches) present, and derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ugh measuremen	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	h may be accep	table)	
Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree canon-maintained und	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Mature upl	
Riparian Buffers  Condition Scores  Delineate ripascriptors. Determine scolow.	Tree stratum (dbh : with > 60% tree cc non-maintained un located within th	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin Score for each r 60%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category i 40%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Mature upl	
Riparian Buffers  Condition Scores  Delineate rips Secriptors. Determine Scolow. Enter the % I	Tree stratum (dbh with > 60% tree conon-maintained und located within the located within	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category i	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Mature upl	cending
Riparian Buffers  Condition Scores  Delineate rips Secriptors. Determine Scolow. Enter the % I	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5  each stream ban each by measurin  Score for each r  60%  1.2	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category i 40%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Mature uplon left describent.  Cl= (Sum % RA * Scribent Cl>	cending  cores*0.01)/2  0.96
Condition Scores  Delineate ripsecriptors. Determine scolow. Enter the % I	Tree stratum (dbh : with > 60% tree cc non-maintained una located within the located with	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5  each stream ban each by measurin Score for each r 60% 1.2	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category i 40% 0.6	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are province.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies a superior of the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed tolst, trails, conditions.  Low 0.5  Low 0.5  Low 100%	Cl= (Sum % RA * St Rt Bank CI >	cores*0.01)/2
Condition Scores  Delineate ripsecriptors. Determine scalow. Enter the % I	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5  each stream ban each by measurin  Score for each r  60%  1.2  100%  1.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category i 40% 0.6	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below the dense way and the blocks below the blocks below the dense way and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are province.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies a superior of the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed tolst, trails, conditions.  Low 0.5  Low 0.5  Low 100%	Cl= (Sum % RA * Si Rt Bank Cl >	cores*0.01)/2 0.96 1.50
Condition Scores  Delineate ripsecriptors. Determine scalow. Enter the % I	Tree stratum (dbh : with > 60% tree conon-maintained und located within the located withi	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5.5  each stream ban each by measuring Score for each reach by measuring 1.2  100% 1.5  aried substrate siffte poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category i 40% 0.6	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with +30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	Cl= (Sum % RA * St Rt Bank CI >	cores*0.01)/2 0.96 1.50 am habitat
Condition Scores  Delineate rip: Secriptors. Determine scolow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5  each stream ban each by measurin Score for each r 60% 1.2  100% 1.5 aried substrate si iffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category i 40% 0.6	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (an the blocks below the blocks below the blocks below the ptimal ments are typically ments are typically ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	Its of length & widt  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area frecently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ee Blocks	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, conditions.  Low 0.5  Low 0.5  Low 100%  100%	CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI > NOTES>> Incised stre	cores*0.01)/2 0.96 1.50 am habitat
Condition Scores  Delineate rip: secriptors. Determine scolow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5.5  each stream ban each by measuring Score for each reach 1.2  100% 1.5  arried substrate siffle poole completimal  re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category i 40% 0.6  Stable habitat ele present in 30-509 sre adequate for are  adequate for are adequate for are adequate for area	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%	CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI > NOTES>> Incised stre	cores*0.01)/2 0.96 1.50 am habitat

### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor N/A CSX R4SB3 02070011 10/13/2015 02-STR-98 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> Conditional Category Moderate embankments, spoil piles, constrictions, livestock Railroad construction changed natural flow Negligible Minor Severe pattern. 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach is disrupted by any of the channel alterations listed in stream reach is the parameter guidelines. If stream has been disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. SCORE 1.5 0.5 1.3 1.1 0.9 0.7 1.10 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF INSERT PHOTOS: Top Left: Typical View Downstream Top Right: View upstream along utility ROW Bottom Right: Typical view upstream DESCRIBE PROPOSED IMPACT:

NC DWQ Stream Identification Form Version 4.11

02-STR-98

Date: October 13, 2015		C2RVA - Area 02	Latitude: 38.3	48924
Evaluator: L. Eggering	County: Staffor	rd	Longitude: -77	7.419815
<b>Total Points:</b> 26.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name:	:
A. Geomorphology (Subtotal = 17.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
Sinuosity of channel along thalweg	0	1	2	(3)
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0_	1	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	1	2	(3)
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 5				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0			3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles		0.5		1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes	= 3
C. Biology (Subtotal = 4)				
18. Fibrous roots in streambed	3	2	(1)	Q
19. Rooted upland plants in streambed	3	2	1	(0)
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish		0.5	1_	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5	$\overline{(1)}$	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1. Other = 0	
*perennial streams may also be identified using other methods	s. See p. 35 of manua	al.		
Notes: Field Sheet 06-SRT-07-Leeland culvert	ballas	t	_	
Sketch:	Mour	/ KIN / intermittent		
perennaro			land est	

				fied Stream N wadeable chan						
Project #		Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC	DC2RVA - Area 02		VA	R2SB3	02070011	10/13/2015		- J	
Nam		e(s) of Evaluator(s)		e and Informa	ation	0.5.5				
Ob 1	L. Eggering		02-STR-99							
Channel (					Conditional Category		1			
	<u>Optimal</u>		Suboptimal		Marginal		Poor		Severe	
	100% Stable balks. Vegetative		or banks are stable (ou-ovo).  Vegetative protection or natural rock prominent (60-80%) AND/OR  Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along		Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40- 60% of stream is covered by sediment. Sediment may be temporary/transient, contribute		widen further. Majority of both banks		s vertical/lateral instability. Severe n incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% o banks, is not preventing erosion. Obvious bank sloughing present.	
Channel Condition										
	sediment deposition 10% of		portions of the reach. Transient sediment covers 10-40% of the stream bottom.		AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.		vegetative protection is present on > 40% of the banks and stable			
Score	3	3	2	2.4	:	2	1.	6	1	
. RIPARIA	N BUFFERS: /	Assess both book						Sheet 06-S		and.
. RIPARIA	N BUFFERS: A		c's 100 foot riparia		e entire SAR. (roo			h may be accep		
RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Left bank in gas ROW ( and railroa	ncludes mowed)
Riparian Buffers Condition	Tree stratum (dbh : with > 60% tree cc non-maintained una located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious sourfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	NOTES>> Left bank in gas ROW ( and railroa	ncludes mowed)
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine so	Tree stratum (dbh: with > 60% tree conon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (dength area))	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, twith <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Left bank in gas ROW ( and railroa	ncludes mowed)
Riparian Buffers  Condition Scores Delineate ripescriptors. Determine scelow. Enter the %	Tree stratum (dbh : with > 60% tree cc non-maintained una located within the located with	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream baneach by measurin Score for each ri 100% 1.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (an the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, twith <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Les sums sparian qual 100 100%	NOTES>> Left bank in gas ROW ( and railroa	ncludes mowed) d ballast.
Riparian Buffers  Condition Scores  Delineate rip scoriptors. Determine scores  Low. Enter the %  Right Bank	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each ri  100%  1.5	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (an the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, twith <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums parian qual 100	NOTES>> Left bank in gas ROW ( and railroa  Cl= (Sum % RA*S Rt Bank CI >	ncludes mowed) d ballast.
Condition Scores  Delineate rip escriptors. Determine so elow. Enter the % Right Bank  Left Bank  INSTREAI	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.5  40% 1.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating lee parian category in 20%  1.2  zes, water velocitieses, stable features.	Low Street Care (dense vegetation).  Low 1.1  Low 1.1  Low 1.1  Low 1.1  Low 2.1  Low 2.1  Low 3.1  Low 3.1  Low 3.1  Low 3.1  Low 3.1  Low 1.1  Lo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Left bank in gas ROW ( and railroa	ncludes mowed) d ballast.
Riparian Buffers  Condition Scores  Delineate rip secriptors. Determine stelow. Enter the % Right Bank  Left Bank  INSTREAI	Tree stratum (dbh : with > 60% tree cc conon-maintained und located within the located wi	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.5  40% 1.5  aried substrate si iffle poole completimal  re typically present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  20% 1.2  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (an the blocks below 40%  0.5  ty and depths; wores.  Conditiona	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, traits, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Left bank in gas ROW (and railroa  Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl> Stream habistabilized of	ncludes mowed) d ballast.

	St	ream In	npact A	ssessm	ent For	rm Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor	
N/A	csx		VA	R2SB3	02070011	10/13/2015	02-STR-99			
	CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization,  NOTES>> shankments, spoil piles, constrictions, livestock  Conditional Category  When railroad was									
•	Negligible Minor Moderate Severe constructed.									
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alteration, lead in the stream reach is disrupted by any of the channel alteration. Itself in the parameter guidelines. If								
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5			
	DEACH C	ONDITION II	IDEV and C	TDEAM CON	IDITION UN	ITS EOD TH	IC DEACH			

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: View downstream toward culvert under railroad Top Right: View downstream toward curvert and a Top Right: Typical view upstream

Bottom Left: View across stream at utility ROW

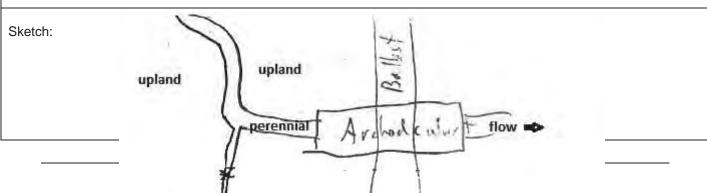
Bottom Right: View upstream, away from railroad

**NC DWQ Stream Identification Form Version 4.11** 

02-STR-99

Date: October 13, 2015	Project/Site: DC2RVA - Area 02	Latitude: 38.348823
Evaluator: L. Eggering	County: Stafford	Longitude: -77.420620
<b>Total Points:</b> 33.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 13.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	9	1	(2)	3
7. Recent alluvial deposits	0	1	2	3
B. Headcuts	8	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual	<u>.</u>			
B. Hydrology (Subtotal = <u>8</u> )				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	(3)
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	= 0	Yes:	= 3
C. Biology (Subtotal = <u>12.25</u> )				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish		0.5		1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	(1.5)
25. Algae	0	0.5		1.5
	ı	FACW = 0.75	OBL = 1.5 Other = 0	)
26. Wetland plants in streambed				
	ods. See p. 35 of manual			



Optimal Suboptimal High Suboptimal Rigarian areas with tree stratum (dbh > 3 inches) present (wth > 60% tree canopy cover and non-maritained understory. Welfand areas.  High Low High Low High Low (dbh > 3 inches) present (wth > 30% tree canopy cover and non-maritained understory. Welfands areas.  High Low Score > 1.2 1.1 0.85 0.75 0.6 0.5  Right Bank  **Reparian Areas 100% Score > 1.2 1.2 0.6 10% Score > 1.2 0.6	Project # Project Name		Ephe	mera	I Stre	fied Stream N	lethodology f	for use in Virg		(For	m 1a)	
N/A DC2RVA - Area 02 VA R6 02070011 N/A 1  Name(s) of Evaluator(s) Stream Name and Information  02-STR-100  2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal (bit Suboptimal Riparian areas along the entire stratum (dbh > 3 inches) present, with soft wee campy cover and are offered and areas. (bit She Petacopus and areas.) (dbh > 3 inches) present, with soft wee campy cover and are offered and areas. (dense herbacopus and areas.) (dense h	NAME   DC2RVA - Area 02   VA   R6   02070011   N/A	Proiect #		Project Name	<del></del>		Cowardin		Date	SAR#		
Condition   Stream Name and information   O2-STR-100	Name(s) of Evaluator(s)   Stream Name and Information   O2-STR-100	•		•		•		02070011	N/A		length	
Conditional Category  Optimal Suboptimal Righ Suboptimal Righ Suboptimal Righarian areas along the entire SAR. (rough measurements of length & width may be acceptable)  NOTES>> Field sheets missing, High Poor. Non-maintained, Gense herbaceous with tree stratum, (dich > 3 inches) present, with 90% present, with 90% receancy rower and an non-maintained deneatory. Wetlands acrospy cover and shrub layers or a mon-maintained understory. Wetlands acrospy cover and shrub layers or a mon-maintained understory. Wetlands acrospy cover and shrub layers or a mon-maintained understory. Wetlands acrospy cover and shrub layers or a mon-maintained understory. Wetlands acrospy cover and shrub layers or a mon-maintained understory. Wetlands acrospy cover and shrub layers or a mon-maintained understory. Wetlands acrospy cover and shrub layers or a mon-maintained understory. Wetlands acrospy cover and shrub layers or a mon-maintained understory. Wetlands acrospy cover and shrub layers or a mon-maintained understory. Wetlands acrospy cover and shrub layers or a mon-maintained understory. Wetlands acrospy cover and shrub layers or a mon-maintained understory. Wetlands acrospy cover wetlands and sabilized, or a maintained understory. Wetlands acrospy cover wetlands areas.  1.5 1.2 1.1 0.85 0.75 0.6 0.5  1. Delineate ripartian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  3. Enter the % Ripartian Areas and Score for each fipartian category in the blocks below.  Biocks equal 100  Clac (Sum % RA * Scores*0.01)/2  Eleft Bank Scores 1.2 0.6	2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of largifit & which may be acceptable)  Optimal Subptimal Marginal Regions along the finance areas and the second of the control of the cont						-	02010011	.471			·
Optimal Suboptimal High Suboptimal Rigarian areas with tree stratum (dbh > 3 inches) present (wth > 60% tree canopy cover and non-maritained understory. Welfand areas.  High Low High Low High Low (dbh > 3 inches) present (wth > 30% tree canopy cover and non-maritained understory. Welfands areas.  High Low Score > 1.2 1.1 0.85 0.75 0.6 0.5  Right Bank  **Reparian Areas 100% Score > 1.2 1.2 0.6 10% Score > 1.2 0.6	Conditional Category    Comparison   Compari							02-ST	R-100			
Optimal   Suboptimal   High Suboptimal   High Suboptimal   Reparian areas with the estatum (dbh > 3 inches) present, with > 60% free canopy cover and a non-manitained understory. Wellands areas.   High Low	Condition   Subsection   Subs	2. RIPARIAN	N BUFFERS: A	Assess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	th may be accept	table)	
Riparian Buffers  Riparian Buffers  The estratum (dbh > 3 inches) present, with soft with the stratum (dbh > 3 inches) present, with soft with the stratum (dbh > 3 inches) present, with soft with the stratum (dbh > 3 inches) present, with soft with the stratum (dbh > 3 inches) present, with soft with the stratum (dbh > 3 inches) present, with soft with the stratum (dbh > 3 inches) present, with soft with the stratum (dbh > 3 inches) present, with soft with the stratum (dbh > 3 inches) present, with soft with the stratum (dbh > 3 inches) present, with soft with the stratum (dbh > 3 inches) present, with soft with the stratum (dbh > 3 inches) present, with soft with the stratum (dbh > 3 inches) present, with soft with the stratum (dbh > 3 inches) present, with soft with a stratum (dbh > 3 inches) present, with so	Riparian Bulfers    Tale straining (dath - 3 acrowle) present   Tale straining (dath - 3 acrowle) present   Straining (dath - 3 acrowle		Onti	mal			<del></del>	ginal	D,	nor.		missing
Condition Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below. 3. Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank  **Right Bank**  **Right Bank**  **Riparian Area ** 100%  Score > 1.2  **Cl= (Sum % RA * Scores*0.01)/2  **Left Bank**  **Riparian Area ** 90% 10%  Score > 1.2 0.6  **Left Bank**  **REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH**  **THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2  **COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF	Condition   1.5   1.2   1.1   0.85   0.75   0.6   0.5		Tree stratum (dbh : with > 60% tree ca	<ul> <li>3 inches) present, nopy cover and an derstory. Wetlands</li> </ul>	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- mountained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces row crops, active feed lots, trails, or other comparable conditions.	information from aerials nearby field	filled out and
Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  3. Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank  % Riparian Area> 100%  Score > 1.2  Left Bank  % Riparian Area> 90% 10%  Score > 1.2   CI= (Sum % RA * Scores*0.01)/2  Left Bank  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The Cis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	Score 3  Definition provided for you be a served to be supported to a whole remoted to a whole remoted to a whole remoted to a decimal places. The CR should be remoted to a whole remoted to a decimal places. The CR should be remoted to a whole remoted to a who	Condition	1	5			-	ı				
descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below. 3. Enter the % Riparian Area and Score for each riparian category in the blocks below.    Right Bank   % Riparian Area   100%   100%   100%	descriptors.  Z Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  Right Bank  Reach CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  MOTE The Cla and RCI should be recarded to a whole number.  Right Bank Discovery Control of the condition of the co											
Score   1.2	Select the % Ripartan Area and Score for each spartan category in the blocks below.  Right Bank    Right Bank   Ripartan Area and Score   1.2		uare footage for e	ach by measurin	ng or estimating le	ngth and width. (	Calculators are pr	ovided for you				
Right Bank   % Riparian Area>   100%     100%	Right Bank Sours > 1.2  Left Bank Sours > 1.2  Sours > 1.2  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  REACH CONDITION INDEX and stream for a whole number.  THE REACH CONDITION INDEX (RCI) >>  COMPENSATION REQUIREMENT (CR) >>		Riparian Area and	Score for each r	iparian category ir	n the blocks below	v.					
Cl= (Sum % RA * Scores*0.01)/2	Left Bank  The Reach Condition INDEX and STREAM CONDITION UNITS FOR THIS REACH  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  REACH CONDITION INDEX (RCI) >>  Reach Conditi				.5.7							
Mark	Left Bank    Score   1.2   0.6   1.74	giit Dalik	Score >	1.2							Cl= (Sum % RA * 9	cores*0.01)/2
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCl) >>  RCl= (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCl X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  MOTE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCl) >>  RCl= (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCl X LF X IF  INSERT PHOTOS:	Loft Bank	% Riparian Area>	90%	10%					100%	<u> </u>	
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	NOTE: The Cis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.    THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2	Leit Balik	Score >								Lt Bank CI >	1.14
RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  INSERT PHOTOS:							NDITION UN	ITS FOR TH		OONDITION IND	EV (BOI)
CR = RCI X LF X IF	INSERT PHOTOS:  CR = RCI X LF X IF	VOTE: The CIS and R	(Ci snould be rounded	to 2 decimal places.	The CR should be roun	nded to a whole number	er.		[			
	INSERT PHOTOS:											ENT (CR) >>
	DESCRIBE PROPOSED IMPACT:											

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date:

02-STR-100

**Latitde:** 38.34815

A. Geomorphology (Subtotal =)  1a. Continuity of channel bed and bank  2. Sinuosity of channel along thalweg  3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence  4. Particle size of stream substrate  5. Active/relict floodplain  6. Depositional bars or benches  7. Recent alluvial deposits  8. Headcuts  9. Grade control  10. Natural valley  11. Second or greater order channel  a artificial ditches are not rated; see discussions in manual  B. Hydrology (Subtotal =)  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris		nt Perennial	Other e.g. Quad Name:  Moderate 2 2 2 2 2 2 2 1 1 1 Yes =	Strong  3 3 3 3 3 3 1.5 1.5
1ª. Continuity of channel bed and bank 2. Sinuosity of channel along thalweg 3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence 4. Particle size of stream substrate 5. Active/relict floodplain 6. Depositional bars or benches 7. Recent alluvial deposits 8. Headcuts 9. Grade control 10. Natural valley 11. Second or greater order channel 3 artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal =) 12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 15. Sediment on plants or debris	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 1 1 1 1 1 1 1 0.5	2 2 2 2 2 2 2 2 2 1 1 1	3 3 3 3 3 3 3 1.5 1.5
1ª- Continuity of channel bed and bank  2. Sinuosity of channel along thalweg  3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence  4. Particle size of stream substrate  5. Active/relict floodplain  6. Depositional bars or benches  7. Recent alluvial deposits  8. Headcuts  9. Grade control  10. Natural valley  11. Second or greater order channel  a artificial ditches are not rated; see discussions in manual  B. Hydrology (Subtotal =)  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris	No = 0	1 1 1 1 1 1 1 1 0.5	2 2 2 2 2 2 2 2 1 1 1	3 3 3 3 3 3 3 1.5 1.5
2. Sinuosity of channel along thalweg 3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence 4. Particle size of stream substrate 5. Active/relict floodplain 6. Depositional bars or benches 7. Recent alluvial deposits 8. Headcuts 9. Grade control 10. Natural valley 11. Second or greater order channel a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal =) 12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 15. Sediment on plants or debris	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 1 1 1 1 1 0.5 0.5	2 2 2 2 2 2 2 1 1 1 Yes =	3 3 3 3 3 3 1.5 1.5
ripple-pool sequence  4. Particle size of stream substrate  5. Active/relict floodplain  6. Depositional bars or benches  7. Recent alluvial deposits  8. Headcuts  9. Grade control  10. Natural valley  11. Second or greater order channel  a artificial ditches are not rated; see discussions in manual  B. Hydrology (Subtotal =)  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 1 1 1 1 0.5 0.5	2 2 2 2 2 1 1 1 Yes =	3 3 3 3 3 1.5 1.5
5. Active/relict floodplain 6. Depositional bars or benches 7. Recent alluvial deposits 8. Headcuts 9. Grade control 10. Natural valley 11. Second or greater order channel a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal =) 12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 15. Sediment on plants or debris	No = 0	1 1 1 1 0.5 0.5	2 2 2 2 1 1 1 Yes =	3 3 3 1.5 1.5
6. Depositional bars or benches 7. Recent alluvial deposits 8. Headcuts 9. Grade control 10. Natural valley 11. Second or greater order channel a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal =) 12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 15. Sediment on plants or debris	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 1 1 0.5 0.5	2 2 2 1 1 Yes =	3 3 3 1.5 1.5
7. Recent alluvial deposits 8. Headcuts 9. Grade control 10. Natural valley 11. Second or greater order channel a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal =) 12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 1 15. Sediment on plants or debris	No = 0	1 0.5 0.5	2 2 1 1 Yes =	3 3 1.5 1.5
8. Headcuts 9. Grade control 10. Natural valley 11. Second or greater order channel a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal =) 12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 15. Sediment on plants or debris	No = 0	1 0.5 0.5	2 1 1 Yes =	3 1.5 1.5
9. Grade control  10. Natural valley  11. Second or greater order channel  a artificial ditches are not rated; see discussions in manual  B. Hydrology (Subtotal =)  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris	No = 0	0.5	1 1 Yes =	1.5 1.5
10. Natural valley  11. Second or greater order channel  a artificial ditches are not rated; see discussions in manual  B. Hydrology (Subtotal =)  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris	No = 0	0.5	1 Yes =	1.5
11. Second or greater order channel  a artificial ditches are not rated; see discussions in manual  B. Hydrology (Subtotal =)  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris	No = 0		Yes =	
a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal =)  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris	0	1		3
a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal =)  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris	0	1	0	
12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris	0	1	0	
12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris	0	1	0	
14. Leaf litter 1 15. Sediment on plants or debris	-		2	3
14. Leaf litter 1 15. Sediment on plants or debris	.5	1	2	3
15. Sediment on plants or debris		1	0.5	0
		0.5	1	1.5
		0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes =	
C. Biology (Subtotal =)		L		
	3	2	1	0
	3	2	1	0
	)	1	2	3
	)	1	2	3
	0	0.5	1	1.5
		0.5	1	1.5
		0.5	1	1.5
		0.5	1	1.5
26. Wetland plants in streambed		W = 0.75; OBL :	-	1.0
*perennial streams may also be identified using other methods. See p. 35		VV = 0.70, OBL	- 1.0 - 01101 - 0	
Notes: NC data for this resource not available (no field shee				
140100: 110 data isi ano recognes net avanasis (no nota circo	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			

	Stre			SSESS fied Stream M			ı (Fori	m 1)			
				wadeable chan							
Project #	F	Project Name	)	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area	-	VA	R4SB	02070011	10/14/2015				
Nam	e(s) of Evaluat K. Astroth	or(s)	Stream Nam	e and Informa	ation	02.6	TD 404				
Channel (	Condition: Asse	ss the cross-sec	tion of the stream	and prevailing of	andition (erosion		TR-101				
Onamio C	Opti				onditional Catego		Po	or	Sev	vere	
					Often incised, but less than Severe or		Overwidened/incised.		1	5	
Channel Condition	Very little incision or 100% stable bar surface protectior prominent (80-11 Stable point bars/t are present. Acce- floodplain or fully bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 10%). AND/OR pankfull benches so to their original developed wide Mid-channel bars, rs few. Transient	erosion or unproted of banks are stylegetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to rnewly develope	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along grach. Transient	or Poor due to lo Erosion may be pri both banks. Veget 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe were bank slopes. seent on 40-60% of tative protection on Streambanks may creut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	Vertically/laterally usiden further. Majare near vertical. E 60-80% of bank protection preser banks, and is insulerosion. AND/OF stream is covere Sediment is tempenature, and contrib AND/OR V-shape	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the d by sediment. orary/transient in uting to instability.	vertical/lateral in incision, flow cor banks. Streamble rooting depth, n vertical/underc protection present banks, is not pre Obvious banks lerosion/raw bar	(or excavated), stability. Severe tatained within the ad below average najority of banks ut. Vegetative on less than 20% of eventing erosion. bughing present. ks on 80-100%. g channel. Greater	
	sediment deposition covers less than 10% of bottom.  portions of the reach. Transient sediment covers 10-40% of the stream bottom.		vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the band sediment depose	ks and stable	than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.		CI		
Score	3		2	.4	;	2	1.	6		l	2.0
								06-SRT-09			
RIPARIAI	N BUFFERS: A	ssess both bank			e entire SAR. (ro						
RIPARIAI	N BUFFERS: A		Con	an areas along the	e entire SAR. (ro			h may be accep	table)	e to	
		mal  3 inches) present, nopy cover and a lerstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy covered a	e entire SAR. (ro	ugh measuremen	ts of length & widt	h may be accep	NOTES>> ROW close stream, cle taken place	aring has	
Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a lerstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Pour High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	NOTES>> ROW close stream, cle taken place	aring has	
Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a lerstory. Weltlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorium Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ripanian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Poo High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, orther comparable conditions.	NOTES>> ROW close stream, cle taken place	aring has	
Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine so	Opti  Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the	3 inches) present, nopy cover and a leastory. Wetlands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tweth < 30% tree canopy cover with maintained understory.  Low  0.75	Por High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> ROW close stream, cle taken place	aring has	
Riparian Buffers  Condition Scores  Delineate rip Scriptors. Determine sclow. Enter the %	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the	3 inches) present, nopy cover and a leastory. Wetlands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tweth < 30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Poor in the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> ROW close stream, cle taken place	earing has	
Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine sclow. Enter the %	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	3 inches) present, nopy cover and a lerstory. Wellands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in 50%	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tweth < 30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Poor in the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> ROW close stream, cle taken place	earing has	CI
Riparian Buffers  Condition Scores  Delineate rip Scriptors. Determine scow. Enter the % Light Bank	Tree stratum (dbh > with > 60% tree ca anon-maintained unc located within the located wit	mal  3 inches) present, nopy cover and a lerstory. Weltands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.75	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tweth < 30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Poor in the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Les sums sparian qual 100 100%	NOTES>> ROW close stream, cle taken place	cores*0.01)/2	CI 0.93
Condition Scores  Delineate rip scriptors. Determine so ow. Enter the % Right Bank Left Bank	Tree stratum (dbh > with > 60% tree ca a non-maintained unc located within the located wi	mal  3 inches) present, nopy cover and a lerstory. Wetlands in parian areas.  5  each stream ban ach by measurin  50%  1.2  30%  1.2  uried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.75	an areas along the ditional Categorium Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. (con the blocks below ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks economics of the seconomics of	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums imparian qual 100 100%	NOTES>> ROW close stream, cle taken place  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2 0.98 0.89	
Riparian Buffers  Condition Scores  Delineate rip Scriptors. Determine scow. Enter the % Right Bank  INSTREAL INSTREAL	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	3 inches) present, nopy cover and a erestory. Wetlands riparian areas.  5  5  5  6  6  6  7  8  8  8  8  8  8  8  8  8  8  8  8	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.75  70% 0.75  zes, water velocit exes, stable featu	an areas along the ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below th	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (bdh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks ed.	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	CI= (Sum % RA * S Rt Bank CI > Lt Bank CI > Sandy with containing	cores*0.01)/2 0.98 0.89 bars	
Riparian Buffers  Condition Scores  Delineate rip Scriptors. Determine solow. Enter the % Right Bank  Left Bank	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	mal  3 inches) present, nopy cover and a erestory. Wetlands riparian areas.  5  sach stream ban each by measurin  50%  1.2  30%  1.2  iried substrate si ffle poole comple mal  te typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.75  70% 0.75  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (on the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (bdh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you  ginal ments are typically % of the reach and	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks ed.  Habitat elements lacking or are un	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> ROW close stream, cle taken place  C = (Sum % RA*S Rt Bank Cl> Lt Bank Cl> Sandy with	cores*0.01)/2 0.98 0.89 bars	
Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine sclow. Enter the % Right Bank  INSTREAI dercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree ca anon-maintained unc located within the located wit	mal  3 inches) present, nopy cover and a erestory. Wetlands riparian areas.  5  sach stream ban each by measurin  50%  1.2  30%  1.2  iried substrate si ffle poole comple mal  te typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.75  70% 0.75  zes, water velocitiexes, stable feature suboptimes su	an areas along the ditional Categories and Council Categories and Categories and Council Categories and Categories and Council Categories and Categories and Council Categories and Categories and Council Categories and Categories	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us calculators are provided and leafy details and leafy details calculators are provided and leafy details calculators. Stable habitat elepresent in 10-30% are adequate for a	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ripanian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substrations are typically ments are typically ments are typically ments are typically ments are typically not maintained understory.	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks ee Bloc	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> ROW close stream, cle taken place  Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl> Sandy with containing rock/pebble	cores*0.01)/2 0.98 0.89 bars	

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB	02070011	10/14/2015	02-STR-101		
	ALTERATION: Stream cross poil piles, constrictions, livestock		Conditiona	I Category				NOTES>> at culvert, n	ninor rip-
	Negligible	Mi	nor	Mode	erate	Sev	ere	iup.	
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5		

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



View of culvert feeding stream

CECDIDE	DDOD	SED I	MDACT.

**NC DWQ Stream Identification Form Version 4.11** 

### 02-STR-101

Date: October 14, 2015	Project/Site: DC2RVA - Area 02	Latitude: 38.348005
Evaluator: K. Astroth	County: Stafford	Longitude: -77.429388
<b>Total Points:</b> 25.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = $12.5$ )	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	Y	2	(3)
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1)	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	Y	(2)	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(P)	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes	= 3
a	_		1	

a artificial ditches are not rated; see discussions in manual

### B. Hydrology (Subtotal = 6.5

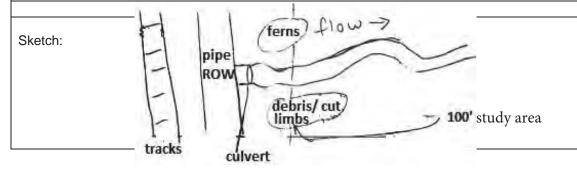
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	(h	lo = 0	Yes	= 3

C. Biology (Subtotal = 6.75

18. Fibrous roots in streambed	3	2	1	(0)
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	8	0.5	1	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	0

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: 06-cul-07 Leeland Pic 278, STR pics 282-279. Field Sheet 06-STR-09-Leeland.



	Ephe	mera				ment for use in Virg		(For	m 1a)		
			OIII		e in ephemeral s		jiiila	1			
Project #	I	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area		VA	R6	02070011	07/18/2016				
	e(s) of Evalua	. ,	Stream Nam	e and Inform	ation	00 CT	D 400				
L. Egg	gering, R. I	oratn				02-51	R-102				
. RIPARIAN	N BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along th	e entire SAR. (ro	ugh measuremen	ts of length & wid	th may be accept			
	Opti	imal		nditional Cate	<u>, ,                                    </u>	ginal	D,	oor	NOTES>> Original Field	Sheet 6-	
	Ори	iiiiai	Subo		IVIAI	Low Marginal:	High Poor:		STR-01	oneer o-	
Riparian Buffers	Tree stratum (dbh : with > 60% tree ca non-maintained und are	nopy cover and an derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a href="https://www.acsun.org/">acsun.org/</a> with <a href="https://www.acsun.org/">acsun.org/</a> water and wat	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Condition		_	High	Low	High	Low	High	Low			
Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
descriptors.  2. Determine squelow.	arian areas along quare footage for e Riparian Area and	each by measurin	g or estimating le	ngth and width.	Calculators are pr	•	of % F	the sums Riparian equal 100			
Right Bank	% Riparian Area>	95% 1.5	5%					100%			
	Score >	1.5	0.5						CI= (Sum % RA * S	cores*0.01)/2	
Left Bank	% Riparian Area>	95%	5%					100%	Rt Bank CI >	1.45	CI
	Score >	1.2	0.5						Lt Bank CI >	1.17	1.31
						NDITION UN	ITS FOR TH			=\(\( \( \) = 0 \( \)	
IOTE: The CIs and F	RCI should be rounded	to 2 decimal places. T	The CR should be rour	nded to a whole numb	er.				CONDITION IND CI= (Riparian CI)		0.66
									ON REQUIREM		0
NSERT PHO	OTOS:										
ESCRIBE F	PROPOSED IN	MPACT:									]

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 07/18/2016

02-STR-102

Latitude: 38.347639

Evaluator: L. Eggering, R. Porath	County: Stafford	d	Longitude: -77	7.437098
<b>Total Points:</b> 16.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 5)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1)	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual	_			
B. Hydrology (Subtotal = $\frac{5}{}$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = $6.25$ )				
18. Fibrous roots in streambed	3	2	<u> </u>	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	-d- C 25 -f	FACW = 0.75; OB	L = 1.5 Other = 0	)
*perennial streams may also be identified using other methon Notes; Original Field Sheet: 6-STR-1	ods. See p. 35 of manua	ll.		
Notes. Original Field Sheet. 0-3110-1				
Sketch:				

		Stre	Unit	fied Stream M	lethodology f	or use in Virg		m 1)			
Project #		Project Name		wadeable chan  Locality	nels classified a Cowardin Class.	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact Factor	
N/A	DC	C2RVA - Area	02	VA	R4SB3	02070011	10/14/2015		length	racioi	
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
	K. Astroth					02-ST	R-103				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal	Conditional Catego Mar	ginal	Po	or	Sev	ere	
	1	AND PARKET	1		Often incised, but less than Severe or		Overwiden		1	5	
Channel Condition	surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide		erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	ew areas of active toted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, of floodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may errut. AND/OR 40- n is covered by diment may be sisent, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. orary/transient in buting to instability.	Deeply incised vertical/lateral ininicision, flow con banks. Streambe rooting depth, m vertical/lunderc protection present c banks, is not pre Obvious bank sit Erosion/raw ban AND/OR Aggrading	stability. Severe tained within the de below average hajority of banks ut. Vegetative on less than 20% of vventing erosion. Dughing present. ks on 80-100%.	
	sediment deposition 10% of	on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depos	nks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	С
Score	3	3	2	.4		2	1.	6	1	l	2.0
2. RIPARIAI	N BUFFERS: A	Assess both bank	's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	th may be accep	table)		
2. RIPARIAI	N BUFFERS: /	Assess both bank	Con	an areas along the ditional Cate ptimal	gory	ginal	ts of length & wide		notes>>		
Riparian Buffers	Opti	imal  > 3 inches) present, anderstory. Wetlands	Con	ditional Cate	gory						
Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cr. non-maintained un	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious spoil lands, denuded surfaces, row crops, active feed oots, ratik, or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow.	Tree stratum (dbh: with > 60% tree conon-maintained un located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream bant each by measurin score for each ries.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both abrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bank each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 20%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate rip. Sescriptors. Legentry of the control of the c	Tree stratum (dbh: with > 60% tree conon-maintained un located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream bant each by measurin score for each ries.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both abrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100		cores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate rip. Sescriptors. Legentry of the control of the c	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin Score for each ri 80% 0.6	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 20%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	0.58	CI
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. Right Bank Left Bank 3. INSTREAL	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  M Riparian Area> Score >	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin Score for each ri 80% 0.6  100% 0.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 20% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/">https://doi.org/10.100/j.nc/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * Si		CI 0.5
Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  Jundercut banks;	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin Score for each ri 80% 0.6  100% 0.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 20% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Calculators are provided to the condition of the condition	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks ed	Low Poor: Impervious provided in the sums iparian qual 100 100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.58	
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin Score for each ri 80% 0.6  100% 0.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.5	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.58	
Condition Scores  1. Delineate rip. descriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree conon-maintained un located within th  1.  arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Core >  W HABITAT: W root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bank each by measurin Score for each ri 80% 0.6  100% 0.5  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.5	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the condition of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically & of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en  Attention of the comparable condition of the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed older conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.58	0.5
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi. root mats; SAV; r  Opti Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bank each by measurin Score for each ri 80% 0.6  100% 0.5  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Kinto Condition C g or estimating le parian category in 20% 0.5  Zes, water velocit exes, stable featur  Subo Stable habitat ele present in 30-50y are adequate fo popul	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below ty and depths; wo res.  Conditional ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to f % R Blocks end	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  he sums iparian qual 100  100%  100%  Iness; shade;	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.58	

	St	ream In	npact A	ssessm	ent For	rm Page	e 2		
Project#	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB3	02070011	10/14/2015	02-STR-103		
S. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock  Conditional Category  Negligible Minor Moderate Severe								NOTES>>	
	Negligible	Mi	nor	Mod	erate	Sev	rere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed	y of the channel in the parameter OR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Typical view of stream Top Right: Typical view of stream

Bottom Left: View of culvert at north end of stream Bottom Right: View of culvert at south end of platform

**NC DWQ Stream Identification Form Version 4.11** 

02-STR-103

Date: October 13, 2015	Project/Site: DC2RVA - Area 02	Latitude: 38.346980
Evaluator: K. Astroth	County: Stafford	Longitude: -77.438241
<b>Total Points:</b> 20.75 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 7)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	Q	1	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches		1	2	3
7. Recent alluvial deposits	(P)	1	2	3
8. Headcuts	(F)	1	2	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 6				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = $7.75$				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)		(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	8	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other metho				
Notes: Concrete drainage, pics 291-287. Field St	heet 06-SRT-12-VI	RE.		
-concrete drainage			1-1	
	TRACKS	1	culv	ert
Sketch: VRE p	latform		197	
(three)				
2.77		100	3/1	
716		3/15		
211	flow ->	grass h	ill	
	1 100	1		

# Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

			For	use in ephemera	l streams				
Project #	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Area	02	VA	R6	02080104	10/15/2015			1
Name(s) of Evaluator(s) Stream Nam			e and Inform	ation					
K. Astroth			02-STR-104						

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Co	onditional Ca	tegory				NOTES>>	
	Optimal	Subo	ptimal	M	arginal	Po	oor	Field Sheet	t 06-STR-15-
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non- maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	PHRD.	
		High	Low	High	Low	High	Low		
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5		
Delineate ripa	arian areas along each stream ban	k into Condition C	ategories and Co	ondition Scores us	sing the descriptors.	Ensure	the sums		
2. Determine sq	uare footage for each by measuring	ng or estimating le	ngth and width.	Calculators are pr	rovided for you below.	of % F	Riparian		
3. Enter the % F	Riparian Area and Score for each ri	parian category in	the blocks belov	v.		Blocks e	equal 100		
Right Bank	% Riparian Area> 50%	15%	35%				100%		
mgm Dank	Score > 1.2	0.75	0.6						
								CI= (Sum % RA * S	Scores*0.01)/2
Left Bank	% Riparian Area> 25%	30%	45%				100%	Rt Bank CI >	0.92
	Score > 1.2	0.75	0.5					Lt Bank CI >	0.75

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

THE REACH CONDITION INDEX (RCI) >>

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF



Top Left: View upstream Top Right: Small pool in stream Bottom Left: View of pipes draining water Bottom Right: Typical view of stream

NC DWO Stream Identification Form Version 4.11

02-STR-104

Date: 10/15/2015	Project/Site: DC2RVA - Area 02	<b>Latitde</b> : 38.343659
Evaluator: K. Astroth	County: Stafford	Longitude: -77.447143
<b>Total Points:</b> 25.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral ntermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 10.5)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	(N	lo = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 5				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
40.0		0.5	4	4 -

12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	o = 0	Yes	= 3
C Piology (Cubtotal 10				

C. Biology (Subtotal = 10					
18. Fibrous roots in streambed	3	2	1	(0)	
19. Rooted upland plants in streambed	3	(2)	1	0	
20. Macrobenthos (note diversity and abundance)	0	Y	2	3	
21. Aquatic Mollusks	Q	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0				

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Mostly dry channel, as channel flows south there are a few small pools with amphibians, at head of stream there are drainage pipes, likely from homes that drain into channel. Head of stream is rip rap at fence gate.

Sketch: As channel flows south it enters 06-WTL-08-PHDR

NAM DC2RVA - Area 02 VA R6 02080104 1  Name(s) of Evaluator(s) Stream Name and Information  ### Conditional Category    Conditional Category   Conditional Categ	Project Name    DC2RVA - Area 02	Project # Project Name	Project Name    NA   DC2RVA - Area 02   V.A   R6   0.2880104		⊏pne	mera		fied Stream M	SSESS Methodology f	or use in Virg		(For	m 1a)	
NAM DC2RVA - Area 02 VA R6 02080104	Name(s) of Evaluator(s)  Stream Name and Information  O2-STR-105  RIPARIAN BUFFERS: Assees both bows 100 correporan areas story the centre SAR. (Excyn necespatements of langth. & with may be acceptable)  Conditional Category  Conditional Cate	NA DC2RVA - Area 02 VA R6 02080104 1 1  Name(a) of Evaluator(a) Streem Name and Information  O2-STR-105  RIPARIAN BUFFERS: Assess both nave 100 for (posts) areas along the centre SAR (rough measurements of length & with may be acceptable)  Conditional Category  Suboptimal Warpinghold (rough posts) areas along the centre sar of the control of the con	NA DC2RVA - Area 02 VA R6 02080104 1 1  Name(s) of Evaluator(s) Success Name and Information  O2-STR-105  RIPARIAN BUFERS: Assess but bank 100 (our parian averas davage to entire SML (local) measurements of larget 8 and may be secondarily as a	Project #		Project Nam	e		Cowardin		Date	SAR#		
Name(s) of Evaluator(s)  Stream Name and Information  O2-STR-105  RIPARIAN BUFFERS: Assess both banks 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Suboptimal Suboptimal Riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  NOTES>> Field sheets missing, information filled out from aerials and service articular width - 3 incheigh present, with 100 sheets articular width - 3 incheigh present with 100 sheets articular width - 3 incheigh present with 100 sheets articular width - 3 incheigh present with 100 sheets articular width - 3 incheigh present with 100 sheets articular width - 3 incheigh present with 100 sheets articular width - 3 incheigh present with 100 sheets are a thrule present with 100 sheets are a thrule production, ponds, or a	RIPARIAN BUFFERS: Assess both how's 100 lest special amost along the erits SAR. (Imigh measurements of length & with may be acceptable)  Optimal Subprimary Marginal Poor	RIPARIAN BUFERS: Assess both banks 100 locd riportion areas along the writer BARC. (rough measurements of length & with may be acceptable)  Conditional Category  High Balangarian  High Balangarian  Fine strain 100 person or control of the control	RIPARIAN BUFFERS: Assess both harvier tittle beer recent amount along the entire SAR. (image measurements of largers & unit may be acceptable).    Conditional Category	-	DC	2RVA - Area	n 02	-		02080104			length	
Conditional Category	Conditional Category  Optimal Suboptimal Law Subopt	Conditional Category    Page	Conditional Subspiriture (See Conditional Subspiriture)    Page						-					•
Optimal Suboptimal Category  Optimal Suboptimal Category  Regardian areas with tree stratum (bh > 3 inches) present, with > 60% free canery cover and an shuftles or a free and stratum (bh > 60% free canery cover and an shuftles or a free and stratum (dh > 3 inches) present, with > 60% free canery cover and an shuftle large and shuftles or a free and shuftles or a f	Conditional Category	Optimal Suboptimal Weight Suboptimal Weight Suboptimal Weight Suboptimal Poor Suboptimal Weight Suboptimal Sub	Optimal Suboptimal Suboptimal Warrian   Poor   Field sheets missing, find a read of the company							02-ST	R-105			
Optimal Suboptimal Category  Optimal Suboptimal High Suboptimal Riparian areas with tree stratum (dbh > 3 inches) present, with > 60% free canery cover and an shuftles or maintained understory. Welland areas with tree stratum (dbh > 3 inches) present, with > 60% free canery cover and an shuftles or maintained understory. Welland areas with tree stratum (dbh > 3 inches) present, with > 60% free canery cover and an shuftles or maintained understory. Welland areas and shuftles or the free present with 20% free canery (dense wegetition). High Marginal Cover and an shuftles or the free present, with 20% free canery (dense wegetition). Welland areas along each stream bank into Condition Categories and Condition Scores using the learning to the lateral free free free free free free free fre	Conditional Category   Figure	Conditional Category   Figure   Conditional Category   Figure	Optimal Suboptimal Suboptimal Warrian   Poor   Field sheets missing, find a read of the company	RIPARIAN	N BUFFERS: /	Assess both ban	k's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	th may be accept	able)	
High Suboptimatic Riparian areas with tree stratum (dbh > 3 inches) present, with 50% tree canopy cover and an on-maintained understory. Wellands areas.  Tree stratum (dbh > 3 inches) present, with 50% tree canopy cover and an on-maintained understory. Wellands areas.  The stratum (dbh > 3 inches) present, with 50% tree canopy cover and an on-maintained understory. Wellands areas.  High Manufacture (dbh > 3 inches) present, with 50% tree canopy cover and an on-maintained understory. Wellands areas.  High Name (dbh > 3 inches) present, with 50% tree canopy cover and an on-maintained understory. Wellands areas.  High Manufacture (dbh > 3 inches) present, with 50% tree canopy cover and an on-maintained understory. Wellands areas.  High Manufacture (dbh > 3 inches) present, with 50% tree canopy cover and an on-maintained understory. Wellands areas.  High Manufacture (dbh > 3 inches) present, with 50% tree canopy cover and an on-maintained understory. Wellands areas.  High Manufacture (dbh > 3 inches) present, with 50% tree canopy cover and an on-maintained understory. Wellands areas.  High Manufacture (dbh > 3 inches) present, with 50% tree canopy cover and an on-maintained understory. Wellands areas.  High Manufacture (dbh > 3 inches) present, with 50% tree canopy cover and an on-maintained understory. Wellands and understory. Wellands areas.  High Manufacture (dbh > 3 inches) present, with 50% tree canopy cover with 40% tree with 40% tr	High Sologistists with the control of the control o	High Sologistists with the control of the control o	Riparian  The cardian (light > 3 inchica) present with the cardian		_		Con	ditional Cate	gory				NOTES>>	
High   Low   High   High   Low   High   High   Low   High	High   Low   Hig	Condition Scores  1.5  1.2  1.1  1.0  1.5  1.2  1.1  1.0  1.5  1.2  1.1  1.0  1.5  1.5  1.2  1.1  1.0  1.5  1.5  1.2  1.1  1.0  1.5  1.5  1.2  1.1  1.0  1.5  1.5  1.2  1.1  1.0  1.5  1.5  1.2  1.1  1.5  1.5  1.5  1.5	High   Low   High   Low   High   Low   High   Low   High   Low   High   Low   Scores   Low   High   High   Low   High   High   Low   High   High   High   Low   High		Tree stratum (dbh: with > 60% tree ca	> 3 inches) presen nopy cover and an derstory. Wetland	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree s canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Low Marginat: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	information from aerials nearby field	filled out and
Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5 elineate riparian areas along each stream bank into Condition Categories and Condition Scores using the ripotors.  Inter the % Riparian Area and Score for each riparian category in the blocks below.  Score > 1.1 0.6   Blocks equal 100    We Riparian Area > 60% 40%   100%    Score > 1.1 0.6   Cla (Sum % RA * Scores*0.01)/2    Off Bank Score > 1.1 0.6   Domain Area   100%   Rt Bank Cl > 0.90    REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  CR = RCl X LF X IF	Scores 1.1. 1.2. 1 1.2. 1 1.2. 1 1.2. 1 1.2. 1	Scores 1.1. 1.2. 1.1. 1.2. 1.2. 1.2. 1.2. 1.2	Scores 1.1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1				High	Low	High		High	Low		
elineate riparian areas along each stream bank into Condition Categories and Condition Scores using the riptors.  Inter the % Riparian Area and Score for each riparian category in the blocks below.  Inter the % Riparian Area Area and Score for each riparian category in the blocks below.  Inter the % Riparian Area Area and Score for each riparian category in the blocks below.  Inter the % Riparian Area Area Area Area Area Area Area Area	Delineate payarian rasea along each stream bank into Condition Categories and Condition Scores using the scriptors.  Deleterrine square footage for each by measuring or estimating length and width. Calculations are provided for you will be stored to the square footage for each inparian category in the blocks below.  Blocks equal 100  Blocks equal 100  Blocks equal 100  Circ (Sam % RA * Server Cult) / 2  Left Bank % Reparters Areas 60% 40% 10.6 100% RR Bank CI > 0.96  Left Bank % Reparters Areas 60% 40% 10.6 100% RR Bank CI > 0.90  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  TO THE Cis and PiC should be rounded to 2 decimal places. The Cit should be rounded to a whole	Delineate payarian rasea along each stream bank into Condition Categories and Condition Scores using the scriptors.  Deleterrine square footage for each by measuring or estimating length and width. Calculations are provided for you will be stored to the square footage for each inparian category in the blocks below.  Blocks equal 100  Blocks equal 100  Blocks equal 100  Circ (Sam % RA * Server Cult) / 2  Left Bank % Reparters Areas 60% 40% 10.6 100% RR Bank CI > 0.96  Left Bank % Reparters Areas 60% 40% 10.6 100% RR Bank CI > 0.90  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  TO THE Cis and PiC should be rounded to 2 decimal places. The Cit should be rounded to a whole	Delineate parama rease along each stream bank into Condition Categories and Condition Scores using the circiptors.  Determine square flockage for each by measuring or estimating largth and width. Calculations are provided for you will be square floating to the provided for you will be square floating to the provided for you will be square floating to the square floating the squ		1.	.5	1.2	1.1	0.85	0.75	0.6	0.5		
ptermine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian    Cl= (Sum % RA * Scores*0.01)/2	Determine square flotage for each typ measuring or estimating length and width. Calculations are provided for you low.  Either the & Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100  Right Bank   Determine square florage for each tymeasuring or estimating length and width. Calculators are provided for you low.  Enter the % Riparian Area and Score for each reparan category in the blocks below.  Blocks equal 100  Right Bank  Score > 1.1 0.6   100%	Determine square footage for each by measuring or estimating length and width. Calculations are provided for you were former to \$600\% & 400% &	Delineate ripa	arian areas along	each stream bar	nk into Condition C	ategories and Co	ondition Scores us	ing the	Ensure	the sums	1		
Note   Compensation	Right Bank    No. Reparted Areas   60%   40%   100%	Right Bank    Separation Areas   60%   40%   100%	Eight Bank   % Riparian Areas   60%   40%	Determine so	quare footage for e	each by measuri	ng or estimating le	ngth and width. (	Calculators are pr	ovided for you	of % F	Riparian		
Score >   1.1   0.6	Score >   1.1   0.6	Score >   1.1   0.6	Soore > 1.1   0.6   Class		Riparian Area and	Score for each	riparian category is	n the blocks below	v.		Blocks e			
Cl= (Sum % RA * Scores*0.01)/2   Output   Score   Sc	Left Bank Score > 1.1 0.6	Left Bank Score > 1.1 0.6	Left Bank Score > 1.1 0.6	ight Bank								100%	4	
Score > 1.1 0.6 Lt Bank CI > 0.90  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  TE The Cits and RCi should be rounded to 2 decimal places. The CR should be rounded to a whole number.  The Cits and RCi should be rounded to 2 decimal places. The CR should be rounded to a whole number.  The Cits and RCi should be rounded to 2 decimal places. The CR should be rounded to a whole number.  The Cits and RCi should be rounded to 2 decimal places. The CR should be rounded to a whole number.  The Cits and RCi should be rounded to 2 decimal places. The CR should be rounded to a whole number.  RCI= (Ripersian CI)/2  COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  SERT PHOTOS:	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  TE The Cits and RCi should be rounded to 2 decimal places. The CR should be rounded to a whole number.  The Cits and RCi should be rounded to 2 decimal places. The CR should be rounded to a whole number.  The Cits and RCi should be rounded to 2 decimal places. The CR should be rounded to a whole number.  The Cits and RCi should be rounded to 2 decimal places. The CR should be rounded to a whole number.  The Cits and RCi should be rounded to 2 decimal places. The CR should be rounded to a whole number.  RCI= (Ripersian CI)/2  COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  SERT PHOTOS:	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH TE. The Clis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  The CR and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  The CR and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  RCI= (Ripperlian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  SERT PHOTOS:		Score	1.1	0.0						CI= (Sum % RA * So	ores*0.01)/2
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  E. The Cis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >> RCise (Repeating Ci) >> COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  SERT PHOTOS:	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  E. The Cis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >> RCise (Repeating Ci) >> COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  SERT PHOTOS:	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  E. The Cis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >> RCise (Repeating Ci) >> COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  SERT PHOTOS:	eft Bank								100%		
The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	THE REACH CONDITION INDEX (RCI) >> RCI= (Rigarian CI)/2 COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  SERT PHOTOS:	THE REACH CONDITION INDEX (RCI) >> RCI= (Rigarian CI)/2 COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  SERT PHOTOS:	THE REACH CONDITION INDEX (RCI) >> RCI= (Rigarian CI)/2 COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  SERT PHOTOS:		Score >			NDEY and S	TPEAM COL	NDITION LIN	ITS EOD TH	IS DEACH	Lt Bank CI >	0.90
RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI x LF x IF	RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI x LF x IF	RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI x LF x IF	E: The CIs and F	RCI should be rounded					ADITION ON	IIS FOR III		CONDITION IND	EX (RCI) >>
CR = RCI X LF X IF	CR = RCI X LF X IF  SERT PHOTOS:	CR = RCI X LF X IF  SERT PHOTOS:	CR = RCI X LF X IF  SERT PHOTOS:											_ `
	SERT PHOTOS:	SERT PHOTOS:	SERT PHOTOS:											ENT (CR) >>
	SCOURE PROPOSED IMPACT.	ESCRIBE PROPOSED IMPACT:	SCRIBE PROPOSED IMPACT:											
DANDE I NOI COLD INIFACT.				SCRIBE F	PROPOSED IN	MPACT:							-	

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date:

02-STR-105

Latitde: 38.342458

Evaluator:	County: Staffor	rd	Longitude: -77.447769		
<b>Total Points:</b> 0 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determ	ination (circle one) ermittent Perennial	Other e.g. Quad Name	:	
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	1	2	3	
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	N	o = 0	Yes	= 3	
<sup>a</sup> artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal =)	1			_	
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	N	o = 0	Yes	= 3	
C. Biology (Subtotal =)					
18. Fibrous roots in streambed	3	2	1	0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	1	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other =	0	
*perennial streams may also be identified using other methods	s. See p. 35 of manu	al.			
Notes: Field sheets not found for this resource.					
Sketch:					

		<b>U</b> 1. U	am A		lethodology f	or use in Vird	inia				
					nels classified a				1.		
Project #	Project Name		•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A			VA	R4SB4	02080104	10/14/2015					
Nam	e(s) of Evaluator(s) Stream Name and  K. Astroth			e and informa	ation	02-ST	R-106				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream	and prevailing co	ondition (erosion,						
	Optimal				onditional Catego		Po	or Severe			
	1	- JAN	1	<u> </u>	Often incised, but	less than Severe or	Overwidene		1	5	
Channel Condition	Very little incision or 100% stable bain surface protection prominent (80-1 Stable point bars' are present. Acce floodplain or fully bankfull benches. and transverse ba sediment depositio	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wellikely has access to or newly develope portions of the r	tion or natural rock 80%) AND/OR ures contribute to skfull and low flow Il defined. Stream b bankfull benches, d floodplains along each. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositiv stability, may be	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by discovered by discovered by discovered that contribute to forming/present. ed channels have	widen further. Major are near vertical. E 60-80% of bank protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	prity of both banks rosion present on as. Vegetative at on 20-40% of fficient to prevent at 60-80% of the d by sediment. Orary/transient in uting to instability. d channels have	vertical/lateral in incision, flow con banks. Streambe rooting depth, rr vertical/underc protection present c banks, is not pre Obvious bank sk Erosion/raw ban AND/OR Aggradin.	stability. Severe tained within the ad below average najority of banks tut. Vegetative on less than 20% of eventing erosion. oughing present. tks on 80-100%. g channel. Greater	
	10% of I			s 10-40% of the bottom.	vegetative protecti banks and depositi	ion on > 40% of the ional features which to stability.	vegetative protection is present on > t 40% of the banks and stable		than 80% of stream deposition, contrib Multiple thread of subterran	channels and/or	(
Score	3	3	2	.4	:	2	1.	6	1		2
NOTES>> 2. RIPARIAN	N BUFFERS: A			_			d Sheet 06-3				
		Assess both bank	c's 100 foot riparia	n areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep	ntable)		
	Opti Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a defectory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	in areas along the	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.		Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	h may be accep	table)	at tree	
2. RIPARIAN Riparian Buffers Condition	Opti Tree stratum (dbh > with > 60% tree canon-maintained und	mal  3 inches) present, nopy cover and a derstory. Wetlands er parian areas.	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	un areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Dense herb vegetation	at tree	
Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelelow.	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	mal  3 inches) present, nopy cover and a lerstory. Wetlands e ripartian areas.  5 ach stream ban ach by measurin Score for each ri	Con Subor  High Suboptimal: Riparian areas with tree stratum (doh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 5%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Co ngth and width. Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Dense herb vegetation	at tree	
Riparian Buffers  Condition Scores  1. Delineate ripadescriptors. 2. Determine scoelow. 3. Enter the % F	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	mal  3 inches) present, nopy cover and a derstory. Wetlands e ripartan areas.	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Dense herb vegetation	at tree g debris.	
Riparian Buffers  Condition Scores  1. Delineate ripadescriptors. 2. Determine scoelow. 3. Enter the % F	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	mal  3 inches) present, unopy cover and a leterstory. Wetlands er riparian areas.  5  ach by measurin  75%  1.2  75%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 5% 0.8	un areas along the ditional Categoritimal  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Congth and width. (and the blocks below 20% 0.75	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Dense heri vegetation line and log  CI= (Sum % RA*S Rt Bank CI >	at tree g debris.	(
Condition Scores  1. Delineate ript descriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank 3. INSTREAI undercut banks; Instream	Tree stratum (dbh > with > 60% tree co non-maintained und located within the located with	mal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5  ach stream ban ach by measurin 75% 1.2  75% 1.2  aried substrate siffle poole completified by the substrate site su	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 5% 0.8  5% 0.8  zes, water velocit exes, stable features	In areas along the ditional Categoritimal  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Congth and width. Congth an	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ex	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Dense heri vegetation line and log	at tree g debris.	1.
Condition Scores  1. Delineate ript descriptors. 22. Determine scoelow. 33. Enter the % f Right Bank  Left Bank  3. INSTREAI	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	mal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5  5  5  6  75%  1.2  75%  1.2  aried substrate siffle poole complete poole c	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 5% 0.8  5% 0.8  Zes, water velocit exes, stable featur Subo Stable habitat ele present in 30-50% are adequate fo	un areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  ategories and Coungth and width. Counthe blocks below 20% 0.75  20% 0.75  y and depths; wores.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (bdh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Dense heri vegetation line and log  Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl> NOTES>>	at tree g debris.	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor N/A CSX R4SB4 02080104 10/14/2015 02-STR-106 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed i srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. 0.5 SCORE 1.5 1.3 1.1 0.9 0.7 1.30

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: Typical view downstream, away from railroad Top Right: Typical view downstream, away from railroad Bottom Left: View downstream from culvert under railroad Bottom Right: Vie wof culvert carrying stream under railroad

NC DWQ Stream Identification Form Version 4.11

02-STR-106

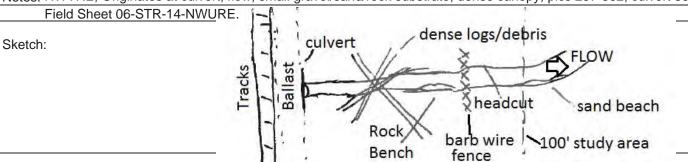
Date: October 14, 2015	Project/Site: DC2RVA - Area 02	Latitude: 38.342481
Evaluator: K. Astroth	County: Stafford	Longitude: -77.448161
<b>Total Points:</b> 28.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*	Ephemeral (inter	mitteni Perenn	e.g. Quad Name:	i	
A Goomorphology (Subtotal – 14	Absent	Weak	Moderate	Strong	
A. Geomorphology (Subtotal = 14 )	O	vveak	-		
1 <sup>a.</sup> Continuity of channel bed and bank		1	(2)	3	
2. Sinuosity of channel along thalweg	0	1	(2)	3	
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	1	(2)	3	
5. Active/relict floodplain	0	(1)	2	3	
6. Depositional bars or benches	0	Y	(2)	3	
7. Recent alluvial deposits	0		2	3	
8. Headcuts	0	$\Theta$	2	3	
9. Grade control		0.5	1	1.5	
10. Natural valley	0	0.5		1.5	
11. Second or greater order channel	No	= 0	Yes = 3		
<sup>a</sup> artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = $5.5$ )					
12. Presence of Baseflow	0	1	(2)	3	
13. Iron oxidizing bacteria	0	1_	(2)	3	
14. Leaf litter	1.5		0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	No	= 0	Yes:	= 3	
C. Biology (Subtotal = $8.75$ )			_		
18. Fibrous roots in streambed	3	2	1	0	
19. Rooted upland plants in streambed	3	(2)		0	
20. Macrobenthos (note diversity and abundance)	٥	1	(2)	3	
21 Aquatic Mollusks		1	<del>                                     </del>	3	

21. Aquatic Mollusks 0.5 1.5 22. Fish 23. Crayfish 0 0.5 1.5 24. Amphibians 0 0.5 1.5 25. Algae 0 0.5 1.5 FACW = 0.75; OBL = 1.5 Other = 026. Wetland plants in streambed

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: NWVRE, Originates at culvert, flow, small gravel/sand/rock substrate, dense canopy, pics 297-302, culvert 303



J. Budn			For use in		icinoaciogy i	or use in Virg	ginia				
N/A Name(s		Project Nam			nels classified a	s intermittent or		SAR#	Impact/SAR	Impact	
Name(s J. Budn	DC2RVA - Area 02			Locality	Class.		Date	SAR#	length	Factor	
•	e(s) of Evaluator(s) Stream Name a		VA e and Informa	R2SB	02080104	10/15/2015					
	dnik, W. Moorhead			e and imornic		02-ST	R-107				
			tion of the stream	and prevailing co	ondition (erosion.		11 101				
					onditional Catego		Po	or	Sev	oro	
_	Optil	IIai	Jubo	ptimai	IVIAI	giriai	W.			//	
	" Lake	ملا	1	Je .		less than Severe or	Overwiden		1	5	
Condition	rery little incision or 100% stable ban surface protection prominent (80-10 Stable point bars/b are present. Acces floodplain or fully	ks. Vegetative or natural rock, 10%). AND/OR ankfull benches as to their original developed wide	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to		or Poor due to lo Erosion may be pro both banks. Veget 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran	stable than Severe wer bank slopes. esent on 40-60% of lative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/Of stream is covere Sediment is temp	ority of both banks rosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. orary/transient in	Deeply incised vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank slo	stability. Severe tained within the ad below average jajority of banks ut. Vegetative in less than 20% of venting erosion.	
	and transverse bar sediment deposition	ikely has access to bankfull benches, full benches. Mid-channel bars, transient on ewly developed floodplains along profitons of the reach. Transient ment deposition covers less than 10% of bottom.  It considers the profit of the transient sediment covers 10-40% of the stream bottom.  It considers the profit of the transient sediment covers 10-40% of the stream bottom.  It considers the profit of the profit of the transient sediment covers 10-40% of the stream bottom.  It considers the profit of the profit of the transient sediment covers 10-40% of the banks and depositional features which contribute to stability.  It considers the profit of the profit		lity. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greate than 80% of stream bed is covered by deposition, contributing to instability.		С					
Score	3		2	.4	:	2	1.	6	1		2.0
2. RIPARIAN E	BUFFERS: A	ssess both bank		an areas along the		ugh measuremen	ts of length & wid	th may be accep	table)		
	Optir	mal		ptimal		ginal	Po	or			
Riparian	ree stratum (dbh > with > 60% tree car on-maintained und located within the	nopy cover and a erstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
			High	Low	High	Low	High	Low			
Condition Scores	1.5	<u></u>	1.2	1.1	0.85	0.75	0.6	0.5			
Delineate riparial escriptors. Determine squaelow. Enter the % Rip	are footage for ea	ach by measurin	g or estimating le	ngth and width. (	Calculators are pr		Ensure to	iparian			
	% Riparian Area>	75%	25%					100%			
gu	Score >	0.6	0.75						CI= (Sum % RA * S	cores*0.01\/2	
Loft Box!	% Riparian Area>	50%	50%					100%	Rt Bank CI >	0.64	CI
Left Bank	Score >	1.1	0.6						Lt Bank CI >	0.85	0.7
B. INSTREAM I					ody and leafy deb	oris; stable substr	ate; low embeded	lness; shade;	NOTES>>		
Instroam	ou mats; SAV; rif	ne poole comple	exes, stable reatu	res. Conditiona	l Category						
Instream Habitat/	Optir	mal		ptimal		ginal	Po				
	le Habitat elements are typically present		re typically present present in 30-50% of the reach and present in 30-50% of the reach and are adequate for maintenance of are ade		d present in 10-30% of the reach and are adequate for maintenance of el		and lacking or are unstable. Habitat				
Score	1.5			ations.		ations.	than 10% o	f the reach.			1,2

Stream Impact Assessment Form Page 2										
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX	VA	R2SB	02080104	10/15/2015	02-STR-107				
NOTES>>  I. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, imbankments, spoil piles, constrictions, livestock  Conditional Category										
	Conditional Category  Negligible Minor Moderate Severe					ere				
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with gal cem	of the channel in the parameter PR 80% of banks bion, riprap, or			
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5			
	REACH C	ONDITION II	NDEX and S	TREAM COM	NDITION UN	ITS FOR TH	IS REACH			
IOTE: The Cls and I	RCI should be rounded to 2 decimal places.	The CR should be roun	ided to a whole number	er.			THE REACH (	CONDITION IND	DEX (RCI) >>	

COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF

RCI= (Sum of all CI's)/5

0

Top Left: View of powerline/gasline corridor Top Right: View of stream under culvert

Bottom Left: View of stream with rail and train in the background

Bottom Right: View downstream toward culvert under railroad

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

**Date:** October 15, 2015

02-STR-107

Latitude: 38.340433

Evaluator: J. Budnik, W. Moorhead	County: Staffor	d	Longitude: -77.448517		
<b>Total Points:</b> 37.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name	:	
A Coorse who leaves (O. 1444). 20	Absent	Weak	Moderate	Ctrong	
A. Geomorphology (Subtotal = 20				Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)	
Sinuosity of channel along thalweg     In-channel structure: ex. riffle-pool, step-pool,	0	1	2	<u> </u>	
ripple-pool sequence	0	1	(2)	3	
Particle size of stream substrate	0	1	(2)	3	
5. Active/relict floodplain	0	1	2	(3)	
6. Depositional bars or benches	0	1	(2)	3	
7. Recent alluvial deposits	0	1	(2)	3	
8. Headcuts	(0)	1	7	3	
9. Grade control	0	0.5	1	(1.5)	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	No	0 = 0	Yes	= 3	
<sup>a</sup> artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = $8.5$ )					
12. Presence of Baseflow	0	1	(2)	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	(1.5)	
16. Organic debris lines or piles	0	0.5	1	(1.5)	
17. Soil-based evidence of high water table?	No	o = 0	Yes		
C. Biology (Subtotal = 9		<u>'</u>			
18. Fibrous roots in streambed	3	2	1	(0)	
19. Rooted upland plants in streambed	(3)	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3	
21. Aquatic Mollusks	(0)	1	2	3	
22. Fish		0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5		1.5	
25. Algae	0	0.5		1.5	
26. Wetland plants in streambed		FACW = 0.75; OBI	L = 1.5 Other = 0	Ö	
*perennial streams may also be identified using other method	s. See p. 35 of manua				
Notes: Field Sheet 06-STR-09.					
Sketch:					

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Impact Cowardin Project # **Project Name** Locality HUC Date SAR# length Factor Class N/A ۷A 02080104 10/15/2015 DC2RVA - Area 02 R6 Name(s) of Evaluator(s) Stream Name and Information J. Budnik, W. Moorhead 25++ 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Field Sheet 06-STR-11 Low Marginal: High Poor: Non-maintained ligh Suboptima Riparian areas High Marginal: nse herbaceo Riparian areas with tree stratum (dbh > 3 inches) and maintained Low Poor: with tree stratum (dbh > 3 inches) vegetation, areas, nurseries no-till cropland; Impervious surfaces, mine riparian areas lacking shrub and tree stratum, hay production, ponds present, with vegetation with resent, with 30% to 60% tree anopy cover and actively grazed pasture, sparsely vegetated non-Free stratum (dbh > 3 inches) presei spoil lands, Riparian 30% tree canon either a shrub with > 60% tree canopy covo nuded surface cover and a maintained layer or a tree layer (dbh > 3 **Buffers** open water. If maintained area eed lots, trails, or areas. containing both understory inches) present, with <30% tree present, tree stratum (dbh >3 herbaceous and recently seeded ther comparable Recent cutov shrub layers or a non-maintained and stabilized, or other comparable conditions (dense vegetation). canopy cover. inches) present, with <30% tree understory condition. anopy cover wit maintained High Low High Low High Low Condition 0.85 0.75 1.5 1.2 1.1 0.6 0.5 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums . Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian % Riparian Area and Score for each riparian category in the blocks below Enter the 60% 40% 100% Right Bank 0.6 0.5 CI= (Sum % RA \* Scores\*0.01)/2 95% 5% 100% Rt Bank CI > CI % Riparian Area> 0.56 Left Bank 0.82 0.6 Lt Bank CI > 1.08 1.1 Score > REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.41

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### **INSERT PHOTOS:**



NC DWQ Stream Identification Form Version 4.11

02-STR-108

1.5

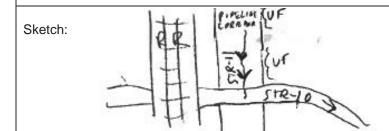
FACW = 0.75; DBL = 1.5 Other = 0

Date: October 15, 2015	Project/Site: DC2RVA - Area 02	Latitude: 38.339039
Evaluator: J. Budnik, W. Moorhead	County: Stafford	Longitude: -77.448722
<b>Total Points:</b> 11.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

II ≥ 19 Or perennan II ≥ 30						
	_					
A. Geomorphology (Subtotal = 4.5	Absent	Weak	Moderate	Strong		
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3		
Sinuosity of channel along thalweg	0	<u> </u>	2	3		
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3		
Particle size of stream substrate	0	(1)	2	3		
5. Active/relict floodplain	0	1	2	3		
6. Depositional bars or benches		1	2	3		
7. Recent alluvial deposits	(0)	1	2	3		
8. Headcuts	0	1	(2)	3		
9. Grade control	0	0.5	1	1.5		
10. Natural valley	(0)	0.5	1	1.5		
11. Second or greater order channel	No	0 = 0	Yes = 3			
<sup>a</sup> artificial ditches are not rated; see discussions in manual						
B. Hydrology (Subtotal = 1						
12. Presence of Baseflow	(0)	1	2	3		
13. Iron oxidizing bacteria	0	1	2	3		
14. Leaf litter	1.5	1	0.5	0		
15. Sediment on plants or debris	0	0.5	1	1.5		
16. Organic debris lines or piles	0	0.5	1	1.5		
17. Soil-based evidence of high water table?	No	0 = 0	Yes	Yes = 3		
C. Biology (Subtotal = $5.75$ )						
18. Fibrous roots in streambed	3	(2)	1	0		
19. Rooted upland plants in streambed	3	2	1	0		
20. Macrobenthos (note diversity and abundance)	( <u>0</u> )	1	2	3		
21. Aquatic Mollusks	<b>8</b>	1	2	3		
22. Fish	8	0.5	1	1.5		
23. Crayfish	0	0.5	1	1.5		
24. Amphibians	(0)	0.5	1	1.5		
			+			

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Very small and short channel connecting to 06-SRT-10. Field Sheet 06-STR-11.



25. Algae

26. Wetland plants in streambed

N/A DC2RVA - Area 02 VA R2SB3 02880104 10/15/15			Stre	Uni	SSESS	/lethodology f	for use in Virg	ginia	m 1)					
NAM DC2RVA - Area 02 VA R2SB3 02080104 10/15/15    Name(s) of Evaluator(s) J. Budnik, W. Moorhead J. Budnik, W. Moorhead Subport of the stream and prevailing conditions (erosion, aggradation)  Condition Con	Project #		Project Name			Cowardin			SAR#					
1. Channel Condition: Assess the cross-section of the stream and prevailing condition (errorius, aggradation)  Conditions  Con	N/A	DC2RVA - Area 02		VA		02080104	10/15/15		lengin	1 dotor				
Channel Condition: Assess the cross-section of the stream and prevaling condition (crosson, aggination)  Optimal Suboptimal Suboptim	Name	e(s) of Evaluator(s) Stream Name		e and Inform	ation									
Channel Condition  Wary ittle notion or active erests in the organic and transverse boards from the protect of the reach. Transverse board strategy of the channel of the protect of the reach. Transverse board transverse board from the protect of the reach. Transverse board transverse board from the protect of the reach. Transverse board transverse board from the protect of the reach. Transverse board transverse board from the protect of the reach. Transverse board transverse board from the protect of the reach. Transverse board transverse boards from the protect of the reach. Transverse board transverse boards from the protect of the reach. Transverse boards from the protect of the protect of the protect of the reach. Transverse boards from the protect of the reach. Transverse boards from the protect of the	J. Bud	dnik, W. Mod	orhead				02-ST	R-109						
Channel Condition  Usy little lecizion re socie e recision (special per la condition)  Supply livinded, for servate of definition of the condition of the condi	1. Channel C	ondition: Asse	ess the cross-sec	ction of the stream										
Channel Condition Conditio		Optimal S		,				Po	or	Sev	/ere			
Very little inclosion or actine exception   Very little inclosion   Very lit		-	L MAP	1						1	5			
Score 3 2.4 2 1.6 1  NOTES>>  Field Sheet 06-STR-10.  Singularian Buffers  Optimal Suboptimal Righran areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Righran areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Righran areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Righran areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Righran areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Righran areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Righran areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal High Suboptimal Righran areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal High Suboptimal Righran areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal High Suboptimal Righran areas along the entire SAR. (rough measurements of length & width may be acceptable)  NOTES>>  Conditional Category  Optimal High Suboptimal Righran areas along the entire SAR. (rough measurements of length & width may be acceptable)  NOTES>>  Right Bank 1.1.6 1.2.2.1.1.0.8.5 0.7.5 0.6.0.5  I. Delineate figarian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  2. Left Bank 2.2.2.1.1.0.8.5 0.6.6 0.5  Cite (Sum % RA * Scores*0.01)/C Right Bank Cite Sarah Scores*0.01)/C Right Bank Cite Sarah Scores*0.01/C Right Bank		Very little incision or active erosion; 80- 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, likely has according to the process of the process or newly developed to the process of the process or newly developed.		erosion or unprote of banks are s Vegetative protec prominent (60 Depositional fea stability. The bar channels are we likely has access t or newly develope	ected banks. Majority stable (60-80%), bition or natural rock b-80%) AND/OR atures contribute to nkfull and low flow ell defined. Stream to bankfull benches, and floodplains along	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strear sediment. Se temporary/tran instability. Depositi	ower bank slopes. resent on 40-60% of étative protection on . Streambanks may ercut. AND/OR 40- m is covered by diment may be usient, contribute ion that contribute to	widen further. Ma are near vertical. I 60-80% of bar protection press banks, and is inst erosion. AND/O stream is cover Sediment is temp nature, and contri	jority of both banks Erosion present on iks. Vegetative ent on 20-40% of ufficient to prevent R 60-80% of the ed by sediment. porary/transient in buting to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present obanks, is not pre Obvious bank sle Erosion/raw ban	estability. Severe nationed within the ed below average najority of banks out. Vegetative on less than 20% of eventing erosion. oughing present. lks on 80-100%.			
Riparian Buffers  Riparian Buffers  Riparian Buffers  Riparian Buffers  Riparian Buffers  Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and ocntaining both herbaceous and shrub layers or a recombinational coated within the riparian areas along each stream bank into Condition Categories and Condition Scores  1.5  1.2  1.1  1.0  Conditional Category  Marginal Poor Low Marginal Poor Lawns, mowed, (dbh > 3 inches) present, with > 60% tree stratum (dbh > 3 inches) present, with > 60% tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a containing both herbaceous and shrub layers or a river wind stratub layers or a river wind recombination of understory. Wellands containing both herbaceous and shrub layers or a river wind stratub layers or a river wind stratum (dbh > 3 inches) present tratum (dbh > 3 inches) present tratum (dbh > 3 inches) present view of the comparable of the co				sediment cove	rs 10-40% of the	vegetative protect banks and deposit	tion on > 40% of the tional features which	have vegetative protection is present on > 40% of the banks and stable		AND/OR Aggrading channel. Grea than 80% of stream bed is covered deposition, contributing to instability Multiple thread channels and/or		С		
2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)    Conditional Category	Score	;	3	2	2.4		2	1	.6	1	1	2.4		
Riparian areas with tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas and containing both herbaceous and shrub layers or a non-maintained understory.  Condition Scores  1.5  1.2  1.1  0.85  0.75  0.66  0.5  1.0 elineate riparian areas along each stream bank into Condition Categories and Condition Scores  Right Bank  Riparian Areas 90% 10% 10% Score > 1.5  0.6  8 Righarian Areas 90% 10% 10% Score > 1.5  0.6  1.8 Inter the % Riparian Areas 90% 10% 50.6  Score > 1.5  0.6  Nort-maintained, Rhigh Marginal: Rhigh Marginal: Rhigh Marginal: Rhon-maintained, with tree stratum, Individual maintained, understory. Wetlands located within the riparian areas. Present, with 20% tree canopy cover and an shrub layers or a non-maintained understory.  Wetlands located within the riparian areas. Present, with 20% tree stratum, have been with 40% tree and shrub layers or a mon-maintained understory.  Low High Low High Low High Low High Low Descriptors.  2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you selected the stratum of the stratum of the stratum of the comparable	2. RIPARIAN			Con	nditional Cate	gory		-						
Condition Scores  1.5  1.2  1.1  0.85  0.75  0.6  0.5  1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below. 3. Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank  % Riparian Area>  75%  25%  100%  Score >  1.5  0.6  Cl= (Sum % RA * Scores*0.01)//.  RET Bank Cl >  1.28  Left Bank  % Riparian Area>  90%  10%  Rt Bank Cl >  1.28  1.41  3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade;  NOTES>>		Tree stratum (dbh: with > 60% tree canon-maintained un	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, sriparian areas lacking shrub and tree stratum, horous ppen water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.					
Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  3. Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank Score > 1.5 0.6   100%    Left Bank Score > 1.5 0.6   100%   Rt Bank Cl > 1.28    Score > 1.5 0.6   Lt Bank Cl > 1.41    3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; NOTES>>	Condition			High	Low	High	Low	High	Low					
descriptors.  2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  3. Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank  % Riparian Area> 75% 25% 100%  Score > 1.5 0.6 Cl= (Sum % RA * Scores*0.01)/2  Left Bank  % Riparian Area> 90% 10% 10% 100% Rt Bank Cl > 1.28  Score > 1.5 0.6 Lt Bank Cl > 1.41  3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; NOTES>>		1	.5	1.2	1.1	0.85	0.75	0.6	0.5	]				
Score >   1.5   0.6	descriptors. 2. Determine sq pelow.	uare footage for e	each by measurin	g or estimating le	ength and width.	Calculators are pr		of % F	Riparian qual 100					
Left Bank         % Riparian Area>         90%         10%         1.28           Score >         1.5         0.6         Lt Bank Cl >         1.41           3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade;         NOTES>>	Right Bank			1					100%					
Left Bank Score > 1.5 0.6 Lt Bank Cl > 1.41  3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade; NOTES>>		o/ Binni A	000/	100/					1000/	· ·				
3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; NOTES>>	Left Bank								100%		1.28	1.3		
			aried substrate si	izes, water veloci		oody and leafy del	bris; stable substr	rate; low embeded	dness; shade;	NOTES>>				
Instream Conditional Category		Conditional												
Habitat/  Stable habitat elements are typically   Stable habitat elements are typically   Habitat elements listed above are	Habitat/	Opt	imal		•					-				
AVAIIable Habitat elements are typically present present in 30-50% of the reach and in greater than 50% of the reach. are adequate for maintenance of elements are typically present in less				present in 30-50° are adequate fo	% of the reach and or maintenance of	d present in 10-30% of the reach and		of the reach and present in 10-30% of the		d lacking or are unstable. Habitat				
populations.         populations.         populations.         than 10% of the reach.           Score         1.5         1.2         0.9         0.5		_						than 10% c	of the reach.	1		1.2		

Stream Impact Assessment Form Page 2									
Project#	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB3	02080104	10/15/15	02-STR-109		
1. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, ambankments, spoil piles, constrictions, livestock  Conditional Category									
	Negligible	nor		erate	Severe				
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed			
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

#### INSERT PHOTOS:



Top Left: Typical view downstream
Top Right: View upstream toward culvert under railroad
Bottom Left: Typical view downstream
Bottom Right: Typical view upstream toward railroad tracks

NC DWQ Stream Identification Form Version 4.11

02-STR-109

Date: October 15, 2015	Project/Site: DC2RVA - Area 02	Latitude: 38.338856
Evaluator: J. Budnik, W. Moorhead	County: Stafford	Longitude: -77.448756
Total Points: 42 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 14)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	2	(3)
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	11	2	(3)
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	(1 <sup>-</sup> )	2	3
8. Headcuts	(0)	Y	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	o = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 12 )				
12. Presence of Baseflow	0	1	2	(3)
13 Iron ovidizing bacteria	0	1		3

12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	(1.5)
17. Soil-based evidence of high water table?	N	o = 0	Yes:	= 3

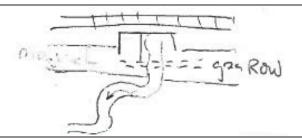
C. Biology (Subtotal = 16

/	_			
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	(3)
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	(1.5)
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75:	OBL = 1.5 Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Snails are the only macroinvertabretes observed. Field Sheet 06-STR-10.

Sketch:



		Stre			sment Methodology f		) (For	111 1 <i>)</i>			
					nels classified a				Impact/SAR	Impact	
Project #		Project Name	•	Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R2	02080104	N/A				
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation	02-ST	D_110				
Channel C	Condition: Asse	es the cross-sec	tion of the stream	and prevailing of	andition (erasion		K-110				
· Onamior c	Opti				Conditional Catego		Po	or	Sev	voro.	
	Ори	IIIIai	3ubo	pulliai	IVIAI	giriai	1		Jev.	ere //	
	~	- WA		Je .		less than Severe or stable than Severe	Overwiden: Vertically/laterally		1	5	
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream to bankfull benches, d floodplains along	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/OI stream is covere Sediment is temp nature, and contrit AND/OR V-shape	ority of both banks frosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. iorary/transient in puting to instability.	Deeply incised vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sle Erosion/raw ban	stability. Severe tained within the do below average tajority of banks ut. Vegetative on less than 20% of venting erosion. Dughing present. ks on 80-100%.	
		on covers less than	sediment cover	reach. Transient is 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the onal features which to stability.	vegetative protecti 40% of the bar sediment depos	on is present on > nks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	CI
Score	3	3	2	.4	:	2	1.	6	1		
NOTES>>		Field Shee	ts missing	, informatio	on was fille	d out using	nearby fie	ld sheets a	and aerials.		
	N BUFFERS: A	Assess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & wid	th may be accep			
		Assess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & wid	th may be accep	table)		
	Opti	Assess both bank  imal  > 3 inches) present, anderstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or of other comparable conditions.	table)		
2. RIPARIAN Riparian Buffers	Opti  Tree stratum (dbh : with > 60% tree ca. non-maintained une located within th	Assess both bank imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	an areas along the ditional Categoriumal Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	table)		
2. RIPARIAN	Opti	Assess both bank imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or of other comparable conditions.	table)		
Riparian Buffers  Condition Scores  Delineate ript escriptors. 2. Determine scorelelow.	Opti Tree stratum (dbh with > 60% tree conon-maintained un located within th	Assess both bank imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition Co	can areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widd  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	table)		
Riparian Buffers  Condition Scores  Delineate ripe tescriptors. Determine scelow.	Opti  Tree stratum (dbh : with > 60% tree canon-maintained und located within the located	Assess both bank imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition Co	can areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widd  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	table)		
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Riparian Buffers  Condition Scores  Delineate ripa lescriptors. Determine scelow. Enter the % f Right Bank  Left Bank  B. INSTREAR	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream bank each by measurin 75% 1.2 70% 1.2 arried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 25% 0.6  30% 0.6	an areas along the ditional Categories and Council Categories and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel olds, trails, or other comparable conditions.  Low 0.5  Low 10.5   NOTES>>  NOTES>>  CI= (Sum % RA * S  Rt Bank CI >	cores*0.01)/2 1.05		
Riparian Buffers  Condition Scores  Delineate ripalescriptors. Determine scoelow. Enter the % If	Tree stratum (dbh: with > 60% tree or non-maintained une located within th  1. arian areas along or quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Score >  W HABITAT: Va root mats; SAV: r	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream bank each by measurin 75% 1.2  70% 1.2  aried substrate si iffle poole comple	Con Subop High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 25% 0.6  30% 0.6  zes, water velocit exes, stable features	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. (dense the blocks below the bloc	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided to the condition of the condition	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, dendued surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	Cl= (Sum % RA * S Rt Bank Cl >	cores*0.01)/2 1.05	
Condition Scores  Delineate rips descriptors. Deltermine scores  Enter the % f Right Bank  Left Bank  Instream Habitat/	Tree stratum (dbh: with > 60% tree or non-maintained une located within th  1. arian areas along or quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Score >  W HABITAT: Va root mats; SAV: r	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream bank each by measurin 75% 1.2 70% 1.2 arried substrate si	Con Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and shrub layers or a non-maintained understory.  High 1.2  Kinto Condition C g or estimating le parian category in 25% 0.6  30% 0.6  zes, water velocit exes, stable featur	an areas along the ditional Categorithmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Coungth and width. Coungth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://www.dbc.com/dbh/s/">wither a shrub layer or a tree layer (dbh &gt; 3 inches) present, with <a href="https://www.dbc.com/dbh/s/">wither a shrub layer or a tree layer (dbh &gt; 3 inches) present, with <a href="https://www.dbc.com/dbc.com/dbc/s/">wither a shrub layer (dbh &gt; 3 inches) present, with </a></a></a>						

Project #		ı <del>c</del> aili ill	าpact A	ssessm	ent For	m Pag	e 2			
N/A	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor		
	CSX	CSX		R2	02080104	N/A	02-STR-110			
4. CHANNE	EL ALTERATION: Stream cross	sings, riprap, cond	rete, gabions, or	concrete blocks, s	straightening of ch	nannel, channel	zation,	NOTES>>		
embankments,	spoil piles, constrictions, livestock		Conditiona	I Category						
	Negligible	Mi	nor		erate	Se	vere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.					
SCORE	1.5	1.3	1.1	0.9	0.7	(	).5			
	REACH C	ONDITION II	NDEX and S	TREAM CON	NDITION UN	ITS FOR T	HIS REACH			
OTE: The CIs and	RCI should be rounded to 2 decimal places.	The CR should be rour	nded to a whole number	er.			THE REACH (			
							COMPENSATI	I= (Sum of all C		_
								IXLFXIF	n⊵N1 (UK)>>	0
NSERT PH	OTOS.									
DESCRIBE	PROPOSED IMPACT:									

Project/Site: DC2RVA - Area 02

### NC DWQ Stream Identification Form Version 4.11

Date:

### 02-STR-110

Latitude: 38.33885

	<sup>-</sup> d	Longitude//	Longitude: -77.449097	
Absent	Weak	Moderate	Strong	
0	1	2	3	
0	1	2	3	
0	1	2	3	
0	1	2	3	
0	1	2	3	
0	1	2	3	
0	1	2	3	
0	1	2	3	
0	0.5	1	1.5	
0	0.5	1	1.5	
N	o = 0	Yes	= 3	
0	1	2	3	
0	1	2	3	
1.5	1		0	
0	0.5		1.5	
0		+	1.5	
N		Yes:		
I		ı		
3	2	1	0	
3	2	1	0	
0	1	2	3	
0	1	2	3	
0	0.5	1	1.5	
0	0.5	1	1.5	
0	0.5	1	1.5	
0	0.5	1	1.5	
		OBL = 1.5 Other = 0		
s. See p. 35 of manua				
,				
	Absent	Absent   Weak	Absent   Weak   Moderate	

Project # Project Name   Locality   Covered   HUC   Date   SAR #   Impact USAR   (eight   Factor   Cates   Cat
N/A DC2RVA - Area 02 VA R6 02080104 08/10/2016 1  Name(s) of Evaluator(s)  L. Postaski, R. Mangum  Optimal Suboptimal  High Suboptimal: Riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal: Riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  NOTES>- This is a linear  This is a linear  Chaine behaceous  High Marginal  Low High Marginal  High Marginal  High Marginal  High Marginal  Nortes extraction (dish > 3 inches) present, with  Soft free comparation during the extraction of the comparation of the production o
RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal High Suboptimal Riparian areas with tree stratum. (Bh - 3 inches) present, with + 60% tree canopy cover and an on-maintained understropy. Wetlands areas.  With the stratum (Bh - 3 inches) present, with + 60% tree canopy cover and an on-maintained understropy. Wetlands areas.  High Low High Low High Low High Low High Low Suboptimal With + 60% tree canopy cover and a non-maintained understropy. Wetlands areas.  High Low High Low High Low High Low High Low High Low Connects to a wetland. (delha - 3 inches) greater, with - 30% tree (annopy cover with connects to a wetland. (delha - 3 inches) greater, with - 30% tree (annopy cover with connects to a wetland. (delha - 3 inches) present, with - 60% tree canopy cover and a nematrianed understropy. Wetlands areas.  High Low High Low High Low High Low High Low Connects to a wetland. (delha - 3 inches) greater with connects to a wetland. (delha - 3 inches) greater with connects to a wetland. (delha - 3 inches) greater with connects to a wetland. (delha - 3 inches) greater with connects to a wetland. (delha - 3 inches) greater with connects to a wetland. (delha - 3 inches) greater with connects to a wetland. (delha - 3 inches) greater with connects to a wetland. (delha - 3 inches) greater with connects to a wetland. (delha - 3 inches) greater with connects to a wetland. (delha - 3 inches) greater with connects to a wetland. (delha - 3 inches) greater with connects to a wetland. (delha - 3 inches) greater with connects to a wetland. (delha - 3 inches) greater with connects to a wetland. (delha - 3 inches) greater with connects to a wetland. (delha - 3 inches) greater with connects to a wetland. (delha - 3 inches) greater with connects to a wetland. (delha - 3 inches) greater with connects to a wetland. (delha - 3 inches) greater with greater with greater with greater with greater with greater wi
RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal High Suboptimal Riparian areas with tree stratum. (8h - 3 inches) present, with 500 feet and orderstory. Welfands areas. with tree stratum (6h - 3 inches) present, with 500 feet and orderstory. Welfands areas. with tree stratum (6h - 3 inches) present, with 500 feet and orderstory. Welfands areas. with tree stratum (6h - 3 inches) present, with 500 feet acongy cover and a containing both with 500 feet acongy cover and a containing both with 100 feet and shrub layers or a real market and orderstory. Welfands areas. In the containing both with 100 feet and orderstory. Welfands areas. In the containing both with 100 feet and orderstory. Welfands areas. In the containing both with 100 feet and orderstory. Welfands areas. In the containing both with 100 feet and orderstory. Welfands areas. In the containing both with 100 feet and orderstory. Welfands areas. In the containing both with 100 feet and orderstory. Welfands areas. In the containing both with 100 feet and orderstory. Welfands areas. In the containing both with 100 feet and orderstory. Welfands areas. In the containing both with 100 feet and orderstory. Welfands areas. In the containing both with 100 feet and orderstory. Welfands areas. In the containing both with 100 feet and orderstory. Welfands areas. In the containing both with 100 feet and orderstory. Welfands areas. In the containing both with 100 feet and orderstory. Welfands areas. In the containing both with 100 feet and orderstory. Welfands areas. In the containing both with 100 feet and orderstory. Welfands areas. In the containing both with 100 feet and orderstory. In the containing both with 100 feet and orderstory. Welfands areas. In the containing both with 100 feet and orderstory. Welfands areas. In the containing both with 100 feet and orderstory. Welfands areas. In the containing both with 100 feet and ordersto
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Optimal Suboptimal High Suboptimal Riparian areas with the stratum (dbh > 3 inches) present, with 30% tree canopy cover and an orn-maintained durderstory. Wellands areas.  It ree stratum (dbh > 3 inches) present, with 50% tree canopy cover and an orn-maintained durderstory. Wellands areas.  It ree stratum (dbh > 3 inches) present, with 50% tree canopy cover and an orn-maintained durderstory. Wellands areas.  It ree stratum (dbh > 3 inches) present, with 50% tree canopy cover and a mort-maintained durderstory. Wellands areas.  It ree stratum (dbh > 3 inches) present, with 50% tree canopy cover and a mort-maintained durderstory. Wellands areas.  It ree stratum (dbh > 3 inches) present, with 50% tree canopy cover and a mort-maintained durderstory. Wellands areas.  It ree stratum (dbh > 3 inches) present, with 50% tree canopy cover and a mort-maintained durderstory. Wellands areas.  It ree stratum (dbh > 3 inches) present, with 50% tree canopy cover and a mort-maintained durderstory. Wellands areas.  It ree stratum (dbh > 3 inches) present, with 50% tree canopy cover and a mort-maintained durderstory. Wellands areas.  It ree stratum (dbh > 3 inches) present, with 50% tree canopy cover and a maintained understory. Wellands areas.  It ree stratum (dbh > 3 inches) present, with 50% tree canopy cover and a maintained understory. Wellands areas with 50% tree canopy cover and a maintained understory. Wellands areas with 50% tree canopy cover. Well-maintained understory. W
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Riparian Buffers
High   Low   High   High   Low   High
Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the scriptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you low.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100  Right Bank  % Riparian Area 100% Score > 0.85  CI= (Sum % RA * Scores*0.01)/2  CI= (Sum % RA * Scores*0.01)/2  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  TE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)//2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF
Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the scriptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you ow.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100  Cl= (Sum % RA * Scores*0.01)/2  Cl= (Sum % RA * Scores*0.01)/2  Left Bank  % Riparian Area 100% Score > 0.85  Cl= (Sum % RA * Scores*0.01)/2  Left Bank  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF
Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian  Blocks equal 100  Blocks equal 100  Cl= (Sum % RA * Scores*0.01)/2  Compensation Index Cl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  Cl= (Riparian Cl)/2  CR = RCI X LF X IF
Enter the % Riparian Area and Score for each riparian category in the blocks below.    Score   N.85
Score   Scor
Cl= (Sum % RA * Scores*0.01)/2   eft Bank   % Riparian Area>   100%   Rt Bank Cl>   0.85     Score >   0.85   Lt Bank Cl>   0.85     Score >   Score >   0.85     Score >   Score >   0.85     Score >   S
Score > 0.85   Lt Bank Cl > 0.85   Lt Bank Cl > 0.85
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI = (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF
he CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF
RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF
CR = RCI X LF X IF

**NC DWQ Stream Identification Form Version 4.11** 

02-STR-111

Date: 08/10/2016	Project/Site: DC2RVA - Area 02	Latitde: 38.338574
Evaluator: L. Postaski, R. Mangum	County: Stafford	Longitude: -77.449080
<b>Total Points:</b> 0 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1 <sup>a</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
3. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal =)			T	
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal =)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other meth-	•	al.		
Notes: Original Field Sheet: 6-B-STR-39, no field	d NC form found.			

Sketch:

		Stre					ı (Forı	•		ı	
				fied Stream N wadeable chan							
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	02	VA	R2SB	02080104	10/15/2015				
	e(s) of Evaluat		Stream Nam	e and Informa	ation		<b>D</b> 446				
	dnik, W. Moo					02-ST	R-113				
Channel C	Condition: Asse	ss the cross-sec	tion of the stream		ondition (erosion, conditional Categor						
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	vere vere	
	1	MAN AND AND AND AND AND AND AND AND AND A	Slightly incised, fr	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally u		Deanly incircal	(or excavated),	
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-10 Stable point bars/t are present. Acces floodplain or fully bankfull benches.	nks. Vegetative or natural rock, 20%). AND/OR pankfull benches as to their original developed wide Mid-channel bars,	erosion or unproted of banks are s Vegetative protect prominent (60- Depositional feat stability. The bar channels are we likely has access to	cted banks. Majority table (60-80%). tion or natural rock- -80%) AND/OR tures contribute to nkfull and low flow Il defined. Stream o bankfull benches, d floodplains along	Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sed temporary/tran	wer bank slopes. esent on 40-60% of tative protection on Streambanks may rout. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Majc are near vertical. E 60-80% of bank protection preser banks, and is insuf erosion. AND/OR stream is covere Sediment is tempo nature, and contrib	rosion present on is. Vegetative at on 20-40% of ficient to prevent 60-80% of the d by sediment. orary/transient in	vertical/lateral in incision, flow cor banks. Streambre rooting depth, n vertical/underc protection present banks, is not pre Obvious bank sl	stability. Severe ntained within the ed below average najority of banks cut. Vegetative on less than 20% of eventing erosion. oughing present.	
	and transverse ba sediment deposition 10% of b	n covers less than	portions of the r sediment cover	reach. Transient rs 10-40% of the bottom.	stability, may be AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the onal features which to stability.	AND/OR V-shape vegetative protection 40% of the ban	d channels have on is present on > ks and stable	than 80% of stream deposition, contrib	g channel. Greater n bed is covered by outing to instability. channels and/or	CI
Score	3		2	.4	;	2	1.0	6		1	2.0
NOTES>>	v	Vould be su	boptimal wi	ithout ~30' s	tretch in rai	Iroad and pi	peline ROW	. Field She	et 06-STR-12	2.	
	N BUFFERS: A	ssess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep	ntable)		
RIPARIAN		mal  3 inches) present, nopy cover and a leastory. Wellands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy covered a	e entire SAR. (roo	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	•	h may be accep	NOTES>> 75% of reac forest, 25% and pipeline	h is mature in railroad	
RIPARIAN	Optio  Tree stratum (dbh > with > 60% tree ca non-maintained und	mal  3 inches) present, nopy cover and a leastory. Wellands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with	Pou High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	NOTES>> 75% of reac forest, 25% and pipeline	h is mature in railroad	
RIPARIAN Riparian Buffers	Optio  Tree stratum (dbh > with > 60% tree ca non-maintained und	mal  3 inches) present, nopy cover and a erstory. Wetlands riparian areas.	Con Subo  Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	ts of length & widti  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or loter comparable conditions.	NOTES>> 75% of reac forest, 25% and pipeline	h is mature in railroad	
Riparian Buffers  Condition Scores  Delineate ripascriptors. Determine scolow.	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a lerstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> 75% of reac forest, 25% and pipeline	h is mature in railroad	
RIPARIAN Riparian Buffers  Condition Scores Delineate ripascriptors. Determine solow. Enter the % F	Option  Tree stratum (dbh > with > 60% tree canon-maintained und located within the locat	mal  3 inches) present, nopy cover and a lerestory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Pour High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % Ri	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> 75% of reac forest, 25% and pipeline	h is mature in railroad e ROW	
Riparian Buffers  Condition Scores  Delineate ripasecriptors. Determine scolow. Enter the % F	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	3 inches) present, nopy cover and a lerstory. Wetlands or riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition Co g or estimating le parian category in 25%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Pour High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % Ri	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> 75% of reac forest, 25% and pipeline	h is mature in railroad e ROW	CI
RIPARIAN Riparian Buffers  Condition Scores  Delineate ripa scriptors. Determine sclow. Enter the % F	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the arian areas along equare footage for expansion areas and \$\text{Riparian Area}\$ & \text{Riparian Area}\$ & \text{Score} >	mal  3 inches) present, nopy cover and a terstory. Wetlands riparian areas.  5  each stream ban ach by measurin  Score for each ri  75%  1.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  K into Condition C g or estimating le parian category in 25% 0.6	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Pour High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % Ri	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%	NOTES>> 75% of reactions, 25% and pipeline  Cl= (Sum % RA * S	h is mature in railroad e ROW	CI 1.28
RIPARIAN  Riparian Buffers  Condition Scores  Delineate rips scriptors. Determine sclow. Enter the % f Right Bank  Left Bank	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the arian areas along equare footage for each stratum (Area Score > M HABITAT: Value of the stratum of the stratu	3 inches) present, nopy cover and a erestory. Wetlands riparian areas.  5 each stream ban ach by measurin 75% 1.5 75% 1.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 25% 0.6	an areas along the ditional Categories and County of the blocks below ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provinced.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % Ri Blocks ec	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed tolst, trails, conditions.  Low 0.5  Low 0.5  Low 100%	NOTES>> 75% of react forest, 25% and pipeline  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	cores*0.01)/2	
RIPARIAN Riparian Buffers  Condition Scores  Delineate ripa scriptors. Determine sclow. Enter the % fi Right Bank  Left Bank  INSTREAN dercut banks;	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.  5 5 ach stream ban ach by measurin 75% 1.5 75% 1.5 ried substrate siffle poole complete the stream of the stream	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.6	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and County and the blocks below the blocks bel	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the control of the con	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with +30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	ts of length & widt  Pour High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks econds and stabilized areas, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> 75% of react forest, 25% and pipeline  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2 1.28 1.28 th is mature	
RIPARIAN Riparian Buffers  Condition Scores  Delineate ripa scoriptors. Determine scolow. Enter the % F Right Bank  INSTREAN INSTREAN Habitat/	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the discount of the control of the con	3 inches) present, nopy cover and a terstory. Wetlands riparian areas.  5 each stream ban ach by measurin 75% 1.5 75% 1.5 ried substrate siffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 25% 0.6  25% 0.6  25% Subo Stable habitat ele	an areas along the ditional Categories and Council Categories and Categories and Council Categories and Categories and Council Categories and Categories	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided by the condition of the condition	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks ee the seeded and stabilized of th	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, conditions.  Low 0.5  Low 0.5  Low 100%  100%	NOTES>> 75% of reactions, 25% and pipeline  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>> 75% of reactions with land undercu	cores*0.01)/2 1.28 1.28 th is mature	
RIPARIAN  Riparian Buffers  Condition Scores  Delineate rips scriptors. Determine solow. Enter the % If Right Bank  Left Bank  INSTREAN dercut banks; Instream	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.  5 sach stream ban ach by measurin 75% 1.5 75% 1.5 ried substrate si ffle poole comple mal	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.6  25% 0.6  Stable habitat ele present in 30-50% ser adequate fo	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr	ts of length & widt  Pour  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % Ri Blocks ec	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%	NOTES>> 75% of react forest, 25% and pipeline  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>> 75% of react forest with	cores*0.01)/2 1.28 1.28 th is mature	

Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02080104	10/15/2015	02-STR-113		
	ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, conc		concrete blocks,	straightening of cl	hannel, channeliz	ation,	NOTES>> Culvert & ve crossing in	
	Negligible	Mi	nor	Mod	erate	Sev	ere	ROW are or	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter DR 80% of banks bion, riprap, or	alterations	•
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5		
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View of clogged culvert under railroad Top Right: View of clogged culvert under railroad Bottom Left: Typical view downstream Bottom Right: Typical view downstream

**NC DWQ Stream Identification Form Version 4.11** 

02-STR-113

Date: October 15, 2015	Project/Site: DC2RVA - Area 02	Latitude: 38.335228
Evaluator: J. Budnik, W. Moorhead	County: Stafford	Longitude: -77.448658
Total Points: 34 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle ene) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 16)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	(1)	2	3
ripple-pool sequence	0	<u> </u>		
Particle size of stream substrate	0		(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	<u> </u>	(2)	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	(0)	<u> </u>	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 9				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5		1.5
16. Organic debris lines or piles	0	0.5	(1) _	1.5
17. Soil-based evidence of high water table?	No	O = 0	Yes:	
C. Biology (Subtotal = $9$ )				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	2	1	(0)
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0		2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0. (5;	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other methods	s. See p. 35 of manua	al.		
Notes: Field Sheet 06-STR-12.				
Sketch: Upland Forest	rip	Home ncrete rap banks by vate sewer	<b>2</b> S.	

For use in ephemeral streams  Cowardin Impact/SAR Impact	Second   Company   Compa	For use in ephemeral streams    Project Mame	Project Name		•			am As				· (. O	ια,	
Comparison   Com	DOZERVA - Area 02 VA Re O 2080 to M R10016 VA Read VA READ O 2080 to M R10016 VA READ VA R	Conditional Category	Conditional Category						e in ephemeral s			•		
Name(s) of Evaluator(s)  L. Postaski, R. Mangum  RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal High Suboptimal High Suboptimal Riparian areas with tree stratum, the stratum, with 10 conditional Category with tree stratum, feeth and the containing both terminational, dish - 3 inches) present, with 50% tree canopy cover and areas.  Tree stratum ((bh > 3 inches) present, with 50% tree canopy cover and areas.  In containing both terminational derivative areas along the entire stratum, the stratum, the stratum, the stratum one-markstaned understory, with seek and areas.  In containing both terminational derivative areas along each streem bank into Condition Categories and Condition Scores using the condition Scores using the stratum areas along each streem bank into Condition Categories and Condition Scores using the condition Scores using the stratum areas along each streem bank into Condition Categories and Condition Scores using the condition Scores using the stratum areas along each streem bank into Condition Categories and Condition Scores using the condition Scores using the stratum areas along each streem bank into Condition Categories and Condition Scores using the stratum areas along each streem bank into Condition Categories and Condition Scores using the stratum areas along each streem bank into Condition Categories and Condition Scores using the stratum areas along each streem bank into Condition Categories and Condition Scores using the stratum areas along each streem bank into Condition Categories and Condition Scores using the stratum areas along each streem bank into Condition Categories and Condition Scores using the stratum areas along each streem bank into Condition Categories and Condition Scores using the stratum areas along each streem bank into Condition Categories and Condition Scores using the stratum areas areas along each streem bank into Condition Categor	Name(s) of Evaluator(s)  L. Postaski, R. Margum  Optimal	Name(s) of Evaluator(s)  L. Postaski, R. Margum  Optimal Suboptimal Very Budgeting Suboptimal Ve	Name(s) of Evaluator(s)  L. Postaski, R. Margum  Operation areas along the entire SAR. (Bodynamic Marginal Low Marginal Lo	Project #	-	Project Name	•	Locality		HUC	Date	SAR#		
RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Low Suboptimal Riparian areas with tree stratum. As a national containing both herbaceous and areas. In coffix free anopy cover and a areas.  It in the stratum (dih > 3 incheal present, with be 20% tree canopy cover and a areas.  It in the stratum (dih > 3 incheal present, with beat and a areas.  It is a stratum (dih > 3 incheal present, with beat and a areas.  It is a stratum (dih > 3 incheal present, with beat and a areas.  It is a stratum (dih > 3 incheal present, with beat and a areas.  It is a stratum (dih > 3 incheal present, with beat and a areas.  It is a stratum (dih > 3 incheal present, with beat and a stratum, law areas.  It is a stratum (dih > 3 incheal present, with beat and a stratum (dih > 3 incheal present, with beat and a stratum (dih > 3 incheal present, with beat and a stratum (dih > 3 incheal present, with beat and a stratum (dih > 3 incheal present, with beat and a stratum (dih > 3 incheal present, with beat and a stratum (dih > 3 incheal present, with beat and a stratum (dih > 3 incheal present, with beat and a stratum (dih > 3 incheal present, with beat and a stratum (dih > 3 incheal present, with beat and a stratum (dih > 3 incheal present, with beat and a stratum (dih > 3 incheal present, with beat and a stratum (dih > 3 incheal present, with beat and a stratum, hay a stratum (dih > 3 incheal present, with beat and a stratum, hay a stratum (dih > 3 incheal present, with beat and a stratum, hay a stratum (dih > 3 incheal present, with beat and a stratum, hay a stratum (dih > 3 incheal present, with beat and a stratum, hay a stra	Continued   Cont	RIPARIAN BUFFERS: Assess both bank's 100 foot reparan areas along the entire SAR. (rough requirements of langth & width may be acceptable)    Coptimal   Suboportimal   Walley S	Postaski, R. Mangum   Postaski, R. Mangum   Postaski, R. Mangumi	N/A	DC	2RVA - Area	02	VA	R6	02080104	8/10/16			1
Conditional Category	Conditional Category    Conditional Category	Conditional Category    Conditional Category	Conditional Category  Coptimal  Suboptimal  Warpinal  Fine additional category  Fine additional				Stream Nam	e and Informa	ation					
Optimal Suboptimal High Suboptimal Repartors areas with tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an inon-maritained understory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an inon-maritained understory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an inon-maritained understory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an inon-maritained understory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an inon-maritained understory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an inon-maritained understory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an inon-maritained understory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an inon-maritained understory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an inon-maritained understory. Wetlands areas.  If the stratum (dbh > 3 inches) present, tree in the stratum (dbh > 3 inches) present, tree in the stratum (dbh > 3 inches) present, tree in the stratum (dbh > 3 inches) present, tree in the stratum (dbh > 3 inches) present, tree in the stratum (dbh > 3 inches) present, tree in the stratum (dbh > 3 inches) present, tree in the stratum (dbh > 3 inches) present, tree in the stratum (dbh > 3 inches) present, tree in the stratum (dbh > 3 inches) present, tree in the stratum (dbh > 3 inches) present, tree in the stratum (dbh > 3 inches) present, tree in the stratum (dbh > 3 inches) present, tree in the stratum (dbh > 3 inches) present, tree in the stratum (dbh > 3 inches) present, tree in the stratum (dbh > 3 inches) present, tree in the stratum (dbh > 3 inches) present, tree in the stratum (dbh > 3 inches) present, tree in the stratum (dbh > 3 inches) present, tree in the stratum (dbh	Coptimal    Coptimal   Suboptimal   Low Suboptimal   Rights in cases   Rights in cas	Coptimal    Coptimal   Suboptimal   Low Suboptimal   Rights in cases   Rights in cas	Coptimal Suboptimal Leve Suboptimal Papers and Conditional Category Water Catalana (Leve Suboptimal Rigoration areas with 1964) the present of the present o	L. Pos	taski, R. Ma	angum				02-51	R-114			
Channel lined with   Channel	Committee   Comm	Committee   Comm	Common   Suboptimal   High S	PARIAN	BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measurement	ts of length & wid	th may be accept	able)	
High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with self-scous and non-maintained understory. Wetlands areas.  If er stratum (dbh > 3 inches) present, with self-scous and non-maintained understory. Wetlands areas. Any large or a present, with softies canopy cover and a non-maintained understory.  High Marginal: Non-maintained condensatory. Wetlands areas. Any large or a present, with soft see canopy cover and a non-maintained understory.  High Low High Low High Low with soft seed and shrub layers or a recent seed on the stratum (dbh > 3 inches) present, with soft sites a production, ponds are shrub, layer of a recent seed and shrub layers or a recent seed to seed the comparable condition.  High Low Low High Low with some services of the stratum (dbh > 3 inches) present, tree stratum, hay greated non-maintained understory.  High Low High Low with season and tree stratum, hay selected non-maintained understory.  High Poor: Low Food maintained barrow services a shrub gloss of search with season and tree stratum, hay selected non-maintained understory.  High Poor: Low Food maintained barrow services and serv	High Suboptimat Right Suboptimate R	High Suboptimat Right Suboptimate R	High Suboptimat. Riginal mines. Rigi		Omti	imal .			<u>, ,                                  </u>	win al	D			ad swith
Parian Tree stratum (bb > 3 inches) present, with 50% tree canopy cover and an inn-marked understory. Wetlands areas.  If the stratum (bb > 3 inches) present, with 50% tree canopy cover and an inn-marked understory. Wetlands areas.  If the stratum (bb > 3 inches) present, with 50% tree canopy cover and an inn-marked understory. Wetlands areas.  If the stratum (bb > 3 inches) present, with 30% present, with 30% present, with 30% tree canopy cover and an inn-marked understory. Wetlands areas.  If the stratum (bb > 3 inches) present, with 30% tree canopy cover and an inn-marked understory. Wetlands areas.  If the stratum (bb > 3 inches) present, with 30% tree canopy cover and an inn-marked understory. Wetlands areas.  If the stratum (bb > 3 inches) present, with 30% tree canopy cover and an inn-marked understory. Wetlands areas.  If the stratum (bb > 3 inches) present, with 30% tree canopy cover and an inn-marked understory. Wetlands areas.  If the stratum (bb > 3 inches) present, with 30% tree canopy cover with a stratum (bb > 3 inches) present, with 30% tree canopy cover with a stratum (bb > 3 inches) present, with 30% tree canopy cover with an interest present areas along each stream bank into Condition Categories and Condition Scores using the inches) present, with 30% tree canopy cover with a stratum (bb > 3 inches) present, with 30% tree canopy cover with a stratum (bb > 3 inches) present, with 30% tree canopy cover with a stratum (bb > 3 inches) present, with 30% tree canopy cover with a stratum (bb > 3 inches) present, with 30% tree canopy cover with a stratum (bb > 3 inches) present, with 30% tree canopy cover with a stratum (bb > 3 inches) present, with 30% tree canopy cover with a stratum (bb > 3 inches) present, with 30% tree canopy cover with a stratum (bb > 3 inches) present, with 30% tree canopy cover with a stratum (bb > 3 inches) present, with 30% tree canopy cover with a stratum (bb > 3 inches) present, with 30% tree canopy cover with a stratum (bb > 3 inches) present with 30 inches present with	High Bubboghmak (Ageans) areas with the ear statutum (with > 3) inches) present, present pre	High Bubboghmak (Ageans) areas with the ear statutum (with > 3) inches) present, present pre	in the Bank Registran Area and Score for each paratina rates at storage of the steep and normal rates and normal rates and storage of the steep and normal rates and norma		Орш	IIIai	Subo		IVIAI	Low Marginal:		Jor		
Scores   1.5   1.2   1.1   0.85   0.75   0.6   0.5	Initiation 1.5 1.2 1.1 0.85 0.75 0.6 0.5 cores   1.5   1.2 1.1 0.85 0.75   0.6 0.5   1.5   1.2 1.1 0.85 0.75   0.6 0.5   1.5   1.2 1.1 0.85 0.75   0.6 0.5   1.5   1.2 1.1 0.85 0.75   0.6 0.5   1.5   1.2 1.1 0.85 0.75   0.6 0.5   1.5   1.2 0.8	socres 1.5 1.2 1.1 0.85 0.75 0.6 0.5    Indication   1.5   1.2   1.1   0.85   0.75   0.6   0.5    Indication   1.5   1.2   1.1   0.85   0.75   0.6   0.5    Indication   1.5   0.5   0.5    Indication   1.5   0.5   0.5    Indication   1.5   0.5   0.5    Indication   1.5   0.5   0.5   0.5    Indica	Initiation 1.5 1.2 1.1 0.85 0.75 0.6 0.5   Illineate ripartian areas along each stream bank into Condition Categories and Condition Scores using the pictors.  Inter the % Ripartian Areas and Score for each ripartian category in the blocks below.  Inter the % Ripartian Areas and Score for each ripartian category in the blocks below.  Inter the % Ripartian Areas and Score for each ripartian category in the blocks below.  Inter the % Ripartian Areas and Score for each ripartian category in the blocks below.  Inter the % Ripartian Areas and Score for each ripartian category in the blocks below.  Inter the % Ripartian Areas and Score for each ripartian category in the blocks below.  Inter the % Ripartian Areas and Score for each ripartian category in the blocks below.  Inter the % Ripartian Areas and Score for each ripartian category in the blocks below.  Inter the % Ripartian Areas and Score for each ripartian category in the blocks below.  Inter the % Ripartian Areas and Score for each ripartian category in the blocks below.  Inter the % Ripartian Areas and Score for each ripartian category in the blocks below.  Inter the % Ripartian Areas and Score for each ripartian category in the blocks below.  Inter the % Ripartian Areas and Score for each ripartian category in the blocks below.  Inter the % Ripartian Areas and Score for each ripartian category in the blocks below.  Inter the % Ripartian Areas and Score for each ripartian category in the blocks equal to 0  Inter the % Ripartian Areas and Score for each ripartian category in the blocks equal to 0  Inter the % Ripartian Areas and Score for each ripartian category in the blocks equal to 0  Inter the % Ripartian Areas and Score for each ripartian category in the blocks equal to 0  Inter the % Ripartian Areas and Score for each ripartian Areas and Score for		with > 60% tree can non-maintained und	nopy cover and an derstory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	enters a bac culvert near railroad ball	kyard the
The % Riparian Area and Score for each riparian category in the blocks below.  Bank	Part of the state	Part of the state	Part of the second part of the s	lition			_	Low	-	Low	High	Low		
termine square footage for each by measuring or estimating length and width. Calculators are provided for you er the % Riparian Area and Score for each riparian category in the blocks below.    Riparian Area   100%   10	Notes that the control of the contro	Notes that the control of the contro	Notes that the control of the contro		1.	5	1.2	1.1	0.85	0.75	0.6	0.5		
Score   Scor	To Bank Score > 0.6   Cla (Sum % RA * Scores*0.01)22   The Bank Score > 0.6   Lit Bank Cl > 0.60   The Cla and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  The Cla and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  Reach Condition index (RCl) >> Release (Riparian Cl)/2   Compensation Requirement (CR) >> CR = RCl X LF X IF  THE THOMOSE	To Bank Score > 0.6   Cla (Sum % RA * Scores*0.01)22   The Bank Score > 0.6   Lit Bank Cl > 0.60   The Cla and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  The Cla and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  Reach Condition index (RCl) >> Release (Riparian Cl)/2   Compensation Requirement (CR) >> CR = RCl X LF X IF  THE THOMOSE	To Bank Score > 0.6   Cla (Sum % RA * Scores*0.01)22   The Bank Score > 0.6   Lit Bank Cl > 0.60   The Cla and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  The Cla and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  Reach Condition index (RCl) >> Release (Riparian Cl)/2   Compensation Requirement (CR) >> CR = RCl X LF X IF  THE THOMOSE	ptors. termine squ ter the % R	uare footage for e	ach by measurin Score for each ri	g or estimating le	ngth and width. (	Calculators are pr	•	of % F	Riparian equal 100		
Mark Claim   Mar	Sk Riparian Areas   100%   Rt Bank CI   0.60   Lt Bank CI   0.60	Mark Cl   No.	Section   Sect	nt Bank	-									
Score > 0.6 Lt Bank CI > 0.60  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  The Cis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  The Cis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  RT PHOTOS:	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  The Cis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  RT PHOTOS:	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  The Cis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  RT PHOTOS:											
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  RT PHOTOS:	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  RT PHOTOS:	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  RT PHOTOS:	t Bank								100%	1	
the CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  RT PHOTOS:	THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  RT PHOTOS:	THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  RT PHOTOS:		Score >								Lt Bank CI >	0.60
COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  RT PHOTOS:	COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  RT PHOTOS:	COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  RT PHOTOS:				UNDITION II	NDEA 224 6	TDEAM CO	IDITION UN	ITS EAD TH	IC DEVCH		
CR = RCI X LF X IF	CR = RCI X LF X IF	CR = RCI X LF X IF	CR = RCI X LF X IF	The CIs and R	CI should be rounded					NDITION UN	ITS FOR TH	THE REACH O		<u> </u>
ERT PHOTOS:				The CIs and R	CI should be rounded					NDITION UN		THE REACH (	CI= (Riparian CI)	/2
	CORREDPONDED IMPACT	SCRIBE PROPOSED IMPACT:	CRIBE PROPOSED IMPACT:							NDITION UN		THE REACH O	CI= (Riparian CI) ON REQUIREM	/2

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 08/10/2016

02-STR-114

Latitude: 38.335178

Evaluator: L. Postaski, R. Mangum	County: Stafford	d	Longitude: -77	7.448946
<b>Total Points:</b> 13 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 6.0	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $\frac{4}{}$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes:	= 3
C. Biology (Subtotal = 3				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	
*perennial streams may also be identified using other metho	ods. See p. 35 of manua			
Notes:	·			
Sketch:				

	Ephe	mera			SSESS Methodology f	ment or use in Virg		(For	m 1a)		
					e in ephemeral s Cowardin		_		Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A Nam	e(s) of Evalua	c2RVA - Area		VA e and Informa	R6	02080104	8/10/16			1	
	staski, R. M		Stream Nam	e and imornic	ation	02-ST	R-115				
2. RIPARIAN	N BUFFERS:	Assess both bank	s's 100 foot riparia	in areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	th may be accept	able)		
	Ont	imal		ditional Cate	<del></del>	ginal	Po	or	NOTES>>Hea		
Riparian Buffers	Tree stratum (dbh with > 60% tree ca non-maintained un	> 3 inches) present, anopy cover and an derstory. Wetlands ass.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	Uphill from b		
Condition	1	.5	High 1.2	Low 1.1	High 0.85	0.75	High 0.6	0.5			
Scores							0.0	0.0			
descriptors.  2. Determine so below.	arian areas along quare footage for e Riparian Area and	each by measurin	g or estimating le	ngth and width. (	Calculators are pr		of % F	he sums Riparian qual 100			
Right Bank	% Riparian Area>	100%	3.7.					100%			
<b>3</b> * **	Score >	1.2							CI= (Sum % RA * So	ores*0.01)/2	
Left Bank	% Riparian Area>	100%						100%	Rt Bank CI >	1.20	CI
	Score >	1.2		NDEV and S	TREAM CO	NDITION UN	ITS EOD TU	IS DEACH	Lt Bank CI >	1.20	1.20
NOTE: The CIs and F	RCI should be rounded					ADITION ON			CONDITION IND	EX (RCI) >>	0.60
								R	CI= (Riparian CI)	/2	
									ON REQUIREM	ENT (CR) >>	0
DESCRIBE F	PROPOSED IF	MPACT:									

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

Date: 08/10/2016

02-STR-115

Latitude: 38.333733

Evaluator: L. Postaski, R. Mangum	County: Staffor	d	Longitude: -77	'.449172
<b>Total Points:</b> 10.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) ermittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 4.0)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
Sinuosity of channel along thalweg	0	$\overline{}$	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0		2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts		1	2	3
9. Grade control		0.5	1	1.5
10. Natural valley		0.5	1	1.5
11. Second or greater order channel		o = 0	Yes:	l .
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 1.5)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 5				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	
*perennial streams may also be identified using other met	hods. See p. 35 of manua	al.		
Notes: Discontinuous stream channel in woode	d area up hill from b	allast. 6-B-STR-3		
Sketch:				

Project # Project Name   Locality   Class   Project Name   Decreased   Proj	Project # Project Name		Eph	emera			SSESS Methodology f			(Forn	n 1a)	
Project #   Project Name   Locality   Class.   HUC   Date   SAR   length   Factor	Project Name   DC2RVA - Area 02   VA   Re   0.2000101   U10782015   V   1						se in ephemeral s		1		I	I 1
Name(s) of Evaluator(s)  K. Astroth  O2-STR-116  RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  High Suboptimal  High Suboptimal  Tree straining (abh > 3 inches) present, and the present continued and serious (abh > 3 inches) present, and the present continued areas.  Riparian areas with live stratum (bh > 3 inches) present, and the present continued areas.  The straining (abh > 3 inches) present, and the present areas with live stratum (bh > 3 inches) present, and the present areas with live stratum (bh > 3 inches) present, and the present areas with live stratum (bh > 3 inches) present, and the present areas with live stratum (bh > 3 inches) present, and the present areas with live stratum (bh > 3 inches) present, and the present areas with live stratum (bh > 3 inches) present, with only a continued areas.  Present in the present areas with live stratum (bh > 3 inches) present, with only a continued areas.  Present in the pr	Name(s) of Evaluator(s)  K. Astroth  Conditional Category  Conditi	Project #		Project Name	•	Locality		HUC	Date	SAR#		-
Riparian Buffers  Riparian Buf	Riparian Buffers  Condition  High Selections in the section SAR, (rough measurements of length & width may be acceptable)  Condition  Fee error of the section of the section SAR, (rough measurements of length & width may be acceptable)  NOTES> Field Selections in the section SAR, (rough measurements of length & width may be acceptable)  NOTES> Field Selections in the section SAR, (rough measurements of length & width may be acceptable)  NOTES> Field Selections in the section SAR, (rough measurements of length & width may be acceptable)  NOTES> Field Selection SAR, (rough measurements of length & width may be acceptable)  NOTES> Field Selection SAR, (rough measurements of length & width may be acceptable)  NOTES> Field Selection SAR, (rough measurements of length & width may be acceptable)  NOTES> Field Selection SAR, (rough measurements of length & width may be acceptable)  NOTES> Field Selection SAR, (rough measurements of length & width may be acceptable)  NOTES> Field Selection SAR, (rough measurements of length & width may be acceptable)  NOTES> Field Selection SAR, (rough measurements of length & width may be acceptable)  NOTES> Selection SAR, (rough measurements of length & width may be acceptable)  NOTES SAR, (rough measurements of length & width may be acceptable)  NOTES SAR, (rough measurements of length & width may be acceptable)  NOTES SAR, (rough measurements of length & width may be acceptable)  NOTES SAR, (rough measurements of length & width may be acceptable)  NOTES SAR, (rough measurements)  NOTES SAR, (rough							02080104	10/15/2015			1
RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)    Conditional Category	Conditional Category   Suboptimal   Warpinal   Port   Category   Port	Name	` '	tor(s)	Stream Name	e and Informa	ition	02-ST	R-116			
Conditional Category  Optimal Suboptimal  High Suboptimal: High Suboptimal: Riparian areas with Riparian areas with threacous and non-markanded understory. Wetlands areas.  Tree stratum (dih > 3 inches) present, with > 60% free canopy cover and an non-markanded understory. Wetlands areas.  The Migh Low High Low High Low High Low High Low High Low High Low Deleterative stratum (dih > 1.5  1.2  1.1  0.85  0.75  0.6  0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  Deleterative square foolage for each by measuring or estimating length and width. Calculators are provided for you below.  Right Bank  % Righarian Areas 50%  500re > 0.75  1.1  The Cis and RCI should be rounded to 2 decimal piaces. The CR should be rounded to a whole number.  Condition Indicated service in the special condition of the stratum (dih > 3 inches) present, with > 60% free canopy cover and an on-markanded understory. Receipt destructive forms and containing both with a stratuble special posture, with > 60% free canopy cover and an on-markanded understory. Receipt and with the stratuble special posture, with > 60% free canopy cover and an on-markanded understory. Receipt special posture, with > 60% free canopy cover and an on-markanded understory. Receipt special posture, with > 60% free canopy cover and an animal post of the stratuble	Conditional Category  High Suboptime  High Sub											
Condition   Cond	Condition   1.5   1.2   1.1   0.85   0.75   0.6   0.5	RIPARIAN	I BUFFERS: A	ssess both bank's				measurements of	f length & width ma	ay be acceptable)		Field
Riparian Buffers  Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an earness with tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an earness with tree canopy cover and containing both at the properties of the control of th	Riparian Buffers    Time statum (dah > 3 notes) present   Section (dah )		Opt	imal			<del>, ,</del>	ginal	Po	oor		
Condition Scores   1.5   1.2   1.1   0.85   0.75   0.6   0.5	Condition  1.5  1.2  1.1  0.85  0.75  0.6  0.5  Delineate ripartien areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  Enter the & Repartien Areas Score for each ripartien category in the blocks below.  Right Bank  **Repartien Areas 50%  **Score > 0.75  1.1  **Left Bank  **Repartien Areas 50%  **Score > 0.75  1.1  **Defended in a repartient areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  **Blocks equal 100  **Condition Score or each ripartien areas or e	•	with > 60% tree ca non-maintained un	anopy cover and an derstory. Wetlands	Riparian areas with tree stratum (db - 3 inches) present with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recen cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a href="documents">30 wree canopy cover with maintained understory.</a>	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	Rd.	
Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100  Blocks equal 100  Cl= (Sum % RA * Scores*0.01)/2  Left Bank  % Riparian Area	Deleteratine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  Enter the %. Right Bank    Society   0.75   1.1	Condition	4	-		!						
Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank  **Right Bank**  **Riparian Area	Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.   Blocks equal 100				ļ		<u> </u>					
Score   Scor	Score > 0.75   1.1	Determine squ	uare footage for ea	ach by measuring Score for each ripa	or estimating leng	th and width. Cal			of % F	Riparian equal 100		
Valuation   Valu	Left Bank	Right Bank	-							100%	-	
Score > 0.75 1.1 Lt Bank CI > 0.93  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  OTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF	Score   Scor		I									
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  SERT PHOTOS:	Left Bank	· ·							100%		
TE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  SERT PHOTOS:					INDEX and S	STREAM CO	NDITION UNI	TS FOR THIS	S REACH		
COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  ISERT PHOTOS:	OTE: The Cls and R	CI should be rounded								CONDITION IND	EX (RCI) >>
CR = RCI X LF X IF	CR = RCI X LF X IF  NSERT PHOTOS:											
	ISERT PHOTOS:											ENT (CR) >>
	DESCRIBE PROPOSED IMPACT:											

Project/Site: DC2RVA - Area 02

NC DWQ Stream Identification Form Version 4.11

**Date:** October 15, 2015

02-STR-116

Latitude: 38.333259

Evaluator: K. Astroth	County: Stafford	ı	Longitude: -77	.448662
<b>Total Points:</b> 16.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 8.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	Y	2	3
7. Recent alluvial deposits	0		2	3
8. Headcuts	0	$\overline{\varphi}$	2	3
9. Grade control	8	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes =	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $\frac{2}{2}$ )				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles		0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes =	= 3
C. Biology (Subtotal = $5.75$ )				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	8	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	)
*perennial streams may also be identified using other method	ds. See p. 35 of manua			
Notes: Harrel Road	0.000	1 2	19 1997 6	101
Field Sheet 06-STR-16 Harrel RD  Sketch:	—	The state of the s	TREAM	Limbs/Lo

		Stre	Unit	fied Stream N	lethodology f	for use in Virg		m 1)			
Dunie 1 f		Duningt No.			nels classified a	s intermittent or		045 "	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	4:	02080104	10/15/2015				
Nam	e(s) of Evaluate  L. Eggering	tor(s)	Stream Nam	e and Informa	ation	02-STI	R-117a				
. Channel C	Condition: Asse	ess the cross-sec	tion of the stream	and prevailing or	ondition (erosion		ν-117α				
	Opti				Conditional Catego		Po	or	Sev	ere	
	1	WAR OF THE PERSON OF THE PERSO	1	يار	Often incised, but	less than Severe or	Overwidene	ed/incised.	1	5	
Channel Condition	Very little incision o 100% stable bar surface protection prominent (80-1-1 Stable point bars/ are present. Acce floodplain or tully bankfull benches. and transverse be sediment depositio 10% of 1	n or natural rock, 00%). AND/OR bankfull benches iss to their original developed wide Mid-channel bars, ars few. Transient in covers less than	erosion or unproted of banks are sit Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope portions of the risk preserved.	ew areas of active cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hisfull and low flow II defined. Stream o bankfull benches, of floodplains along reach. Transient is 10-40% of the bottom.	or Poor due to Ic Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran instability. Depositi stability, may be AND/OR V-shap	stable than Severe were bank slopes, esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be issent, contribute to forming/present. red channels have is on on > 40% of the	Vertically/laterally widen further. Maje are near vertical. E 60-80% of bani protection preset banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib. AND/OR V-shape vegetative protectic 40% of the ban	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent 6-0-80% of the dby sediment. orary/transient in juting to instability, dd channels have on is present on >	Deeply incised vertical/lateral in incision, flow cor banks. Streambe rooting depth, rr vertical/underc protection present of banks, is not pre Obvious bank sla Erosion/raw ban AND/OR Aggradin, than 80% of stream deposition, contrib	stability. Severe tained within the di below average ajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%. g channel. Greater i bed is covered by	
						ional features which to stability.	sediment depos	ition is absent.	Multiple thread of subterran	channels and/or	CI
Score	3	3	2	.4		2	1.	6	1		1.6
								t 06-STR-1			
	N BUFFERS: A	Assess both bank		an areas along the						High	
	N BUFFERS: A		Con		gory			h may be accep	NOTES>>	High	
RIPARIAI Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	a 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> quality fore surrounds creek, the g and CSX ra ditch and b lower the s	est the gas ROW, nilroad pallast	
. RIPARIAI	Opti	imal 3 inches) present, anopy cover and a derstory. Weltands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	an areas along the ditional Cate(ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">30% tree canopy cover.</a> High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> quality fore surrounds creek, the g and CSX ra ditch and b lower the s	est the gas ROW, nilroad pallast	
Riparian Buffers  Condition Scores  Delineate ripiescriptors. 2. Determine scorelelow.	Opti  Tree stratum (dbh > with > 60% tree ca	imal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Categories and Congth and width. Categories and Categori	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are presents	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> quality fore surrounds creek, the g and CSX ra ditch and b lower the s	est the gas ROW, nilroad pallast	
Riparian Buffers  Condition Scores  Delineate ripiescriptors. Determine sceletow.	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban ach by measuring score for each reach r	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in 40%	an areas along the ditional Categories and Congth and width. Categories and Categories and Congth and Width. Categories and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are presents	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> quality fore surrounds creek, the g and CSX ra ditch and b lower the s	est the gas ROW, nilroad pallast	
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow.	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	imal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban ach by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in	an areas along the ditional Categories and Congth and width. Categories and Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are presents	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, rother comparable conditions.  Low 0.5  Low 0.5	NOTES>> quality fore surrounds creek, the g and CSX ra ditch and b lower the s	est the gas ROW, gas ROW, gallosd pallast core.	
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine scelow. Enter the % I	Tree stratum (dbh > with > 60% tree co non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands derstory. Wetlands for inches and a derstory inc	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in 40%	an areas along the ditional Categories and Congth and width. Categories and Categories and Congth and Width. Categories and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are presents	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, rother comparable conditions.  Low 0.5  Low 0.5	NOTES>> quality fore surrounds creek, the g and CSX ra ditch and k lower the s	est the gas ROW, nilroad pallast core.	CI
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine seelow. Enter the % I	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal 3 inches) present, anopy cover and a destroir. Wellands e riparian areas.  5  each stream ban ach by measurin Score for each r 20% 1.2  100% 1.5	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le coparian category in 40% 0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the control of the con	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ir iparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory. Low  0.75  Sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-fill cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5	NOTES>> quality fore surrounds creek, the g and CSX ra ditch and k lower the s	est the gas ROW, nilroad pallast core.	CI 1.14
Riparian Buffers  Condition Scores  Delineate rip: escriptors. Determine scelow. Enter the % I	Tree stratum (dbh > with > 60% tree or non-maintained und located within the located with	5  sach stream ban ach by measurin 20% 1.2 100% 1.5 aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 40% 0.85	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the control of the con	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ir iparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory. Low  0.75  Sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-fill cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5	NOTES>> quality fore surrounds creek, the g and CSX ra ditch and b lower the s  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	est the gas ROW, nilroad pallast core.  pores*0.01//2 0.78 1.50  Decent	
Riparian Buffers  Condition Scores  Delineate rip. lescriptors. Determine scoelow. Senter the % I	Tree stratum (dbh > with > 60% tree canon-maintained une located within the located withi	imal  3 inches) present, anopy cover and a dierstry. Wetlands er riparian areas.  5  ach stream ban each by measuring score for each race to the stream ban each by measuring score for each race to t	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 40% 0.85	an areas along the ditional Categoriem al Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Coungth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ir iparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  rovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks er	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	NOTES>> quality fore surrounds creek, the g and CSX ra ditch and k lower the s  Cl= (Sum % RA*S Rt Bank CI> Lt Bank CI> NOTES>> habitat for	est the gas ROW, nilroad pallast core.  pores*0.01//2 0.78 1.50  Decent	
Condition Scores Delineate rip. descriptors. Deltermine scelew. Enter the % I Right Bank  Left Bank  Instream Habitat/	Tree stratum (dbh > with > 60% tree oc onon-maintained und located within the located wit	imal  3 inches) present, anopy cover and a destratory. Wetlands feerstory. Wetlands feer fiparian areas.  5  each stream ban ach by measurin  Score for each r  20%  1.2  100%  1.5  arried substrate siffle poole completimal	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 40% 0.85	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are present, with sample of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, priparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a>0.75</a> Low  0.75  sing the rovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr  of % R  Blocks ed  Blocks ed  High Doks ed  All Control of the control of the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> quality fore surrounds creek, the g and CSX ra ditch and b lower the s  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	est the gas ROW, nilroad pallast core.  pores*0.01//2 0.78 1.50  Decent	
Riparian Buffers  Condition Scores Delineate ripilescriptors. Determine scielow. Right Bank  Left Bank  I. Left Bank  I. Left Bank  I. INSTREAI	Tree stratum (dbh > with > 60% tree oc onon-maintained und located within the located wit	imal  3 inches) present, anopy cover and a dierstory. Wetlands er riparian areas.  5  sach stream ban each by measuring the sach by	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 40% 0.85	an areas along the ditional Categoriem al Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. Congth and depths; wo res.  Conditionaptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High 0.85  Calculators are provided in the care provided in th	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the rovided for you  bris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-fill cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, active feed lots, active fe	NOTES>> quality fore surrounds creek, the g and CSX ra ditch and b lower the s  Cl= (Sum % RA * S Rt Bank Cl> Lt Bank Cl> NOTES>> habitat for species.	est the gas ROW, nilroad pallast core.  pores*0.01//2 0.78 1.50  Decent	

	C+	roam In	nnact A	eegeem	ent For	m Pag	0.2			
Project #	Applicant	caiii iii	Locality	SSESSM Cowardin	HUC HUC	n Pag	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	Class.	нос		02-STR-117a	_	impact Factor	
	L ALTERATION: Stream cross	ingo riprop cono		congrete blocks	atraightaning of al			NOTES>>	Thio	
	spoil piles, constrictions, livestock	ings, riprap, cond			straigntening of cr	nannei, channeil	zation,	stretch has		
	Negligible	Mi	nor	al Category Mod	erate	Se	vere	channelize	ed.	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel alterations listed in	is disrupted by any of the channel	Greater than 8 disrupted by an alterations listed guidelines AND/6 shored with ga	30% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or nent.			
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			1.50
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IIS REACH			
NOTE: The CIs and F	RCI should be rounded to 2 decimal places. T	The CR should be roun	nded to a whole numb	er.				CONDITION IN		
								ION REQUIREM		0
					_		CR = RC	I X LF X IF		
DESCRIBE F	Top Left: Typical view of s Bottom Right: Typical view PROPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11 Claiborne Run 02-STR-117a

110 2 11 Q Bot cam Identification I of m 1018	1011 1111	
Date: 10/15/2015	Project/Site: DC2RVA - Area 02	Latitde: 38.332190
Evaluator: L. Eggering	County: Stafford	Longitude: -77.448724
<b>Total Points:</b> $45.5$ Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 23.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	2	(3)
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	1_	(2)	3
7. Recent alluvial deposits	0	1)	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No	0 = 0	Yes:	$\overline{}$
a artificial ditches are not rated; see discussions in manual	I.			
B. Hydrology (Subtotal = 9.5				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	Y	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes :	
C. Biology (Subtotal = 12.5	- 1			
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	9	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5	1	(1.5)
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed			OBL = 1.5 Other = 0	_
*perennial streams may also be identified using other method	s See n 35 of manua		JIII Dillor - C	•
Notes: This stream is north of Harrell Rd. Stream t			ned Field Sheet 06	STR-19 Nor
Point.	.orradod III IIddapi	an are wen aran	1100111010	
Point.	44		11	
Sketch:	17		11	
	11	~	1) 8	
	1	-	1 21	
			-	and delta
<u>~2</u> utility F	ROW			- marine
- Control of		1000		

		Stre		SSESS			i (Fori	m 1)			
				wadeable chan	nels classified a	s intermittent or	perennial		Impact/SAR	Impact	
Project #		Project Name	)	Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A		2RVA - Area		VA	R2	02080104	10/15/2015				
	e(s) of Evaluat	. ,	Stream Nam	e and Informa	ation	02 CTI	2 447h				
	chell, M. Roc		for the state of	1	P.C	02-STI	X-117D				
. Channel C	Condition: Asse			C	onditional Catego	ry	_		_		
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
		- JUN	Slightly incised, fu	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		Deeply incised	(or excavated)	
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	n or natural rock, 00%). AND/OR bankfull benches as to their original developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, dd floodplains along reach. Transient	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Major are near vertical. E 60-80% of banh protection preser banks, and is insurerosion. AND/OF stream is covere Sediment is tempnature, and contrib AND/OR V-shape.	rosion present on ks. Vegetative nt on 20-40% of fficient to prevent & 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present obanks, is not pre Obvious bank sik Erosion/raw ban	stability. Severe tained within the do below average tajority of banks ut. Vegetative in less than 20% of venting erosion. Sughing present. It is on 80-100%.	
	sediment depositio		sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the band	on is present on > iks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1		2.0
NOTES>>				Field	Sheet 06-	STR-19 Tea	am 2.				
RIPARIAN	N BUFFERS: A	Access both bank	r's 100 foot riparia	an areas along the	e entire SAP (ro	ugh measuremen	ts of length & widt	h may he accen	table)		
. RIPARIAI	N BUFFERS: A	Assess both bank				ugh measuremen	ts of length & widt	h may be accep	table)		
. RIPARIAN	N BUFFERS: A		Con	an areas along the ditional Cate ptimal	gory	ugh measuremen ginal	ts of length & widt				
RIPARIAN Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	a 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation,					
Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca	a 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti  Tree stratum (dbh > with > 60% tree ca	imal 3 inches) present, anopy cover and a derstory. Wellands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  Delineate ripaescriptors. Determine scelow.	Opti	imal  - 3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % F	Tree stratum (dbh > with > 60% tree co non-maintained und located within the located with	imal 3 inches) present, anopy cover and a terstory. Wetlands e riparian areas.  5  each stream ban each stream ban each by measurin Score for each ri 100%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % F	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	imal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban ach by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5		cores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate ripaescriptors. Determine scoelow.	Tree stratum (dbh > with > 60% tree co conon-maintained unclocated within the located wit	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5  each stream ban ach by measurin  Score for each ri  100%  1.1	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>  CI≕ (Sum % RA * S  Rt Bank CI >	1.10	CI
Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % f	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal 3 inches) present, anopy cover and a destroin. Wellands eriparian areas.  5  each stream ban ach by measurin Score for each ri 100% 1.1	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the control of the con	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies the seeded and stabilized area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >		CI 1.10
Riparian Buffers  Condition Scores  Delineate ripasscriptors. Determine solow. Enter the % f	Tree stratum (dbh > with > 60% tree co conon-maintained unclocated within the located wit	5  sach stream ban ach by measurin 100% 1.1 aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Categorian delicational Categorian delication and categorian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and County and width. County the blocks below the blocks below the blocks below the strategory and depths; wo res.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Academic Scores us Calculators are prov.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies the seeded and stabilized area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  CI≕ (Sum % RA * S  Rt Bank CI >	1.10	
Condition Scores  Delineate ripe escriptors Determine so elow elow Enter the % F Right Bank  Left Bank  INSTREAI ndercut banks;	Tree stratum (dbh > with > 60% tree canon-maintained une located within the located withi	imal  3 inches) present, anopy cover and a ferstory. Wetlands er riparian areas.  5  ach stream ban each by measurin 100% 1.1  100% 1.1  arried substrate siffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable feature	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other confer conferious.  Low 0.5  Low 100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.10	
Riparian Buffers  Condition Scores  Delineate rips escriptors. Determine scelow. Enter the % f Right Bank  Left Bank  INSTREAI	Tree stratum (dbh > with > 60% tree oc onon-maintained und located within the located wit	imal  3 inches) present, anopy cover and a derstory. Wetlands for liparian areas.  5  each stream ban ach by measurin  Score for each ri  100%  1.1  100%  1.1  artied substrate si fffle poole completimal	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo Stable habitat elei	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are present, with sample of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks existed and stabilized and stabiliz	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.10	
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % If Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree oc onon-maintained und located within the located wit	imal  3 inches) present, anopy cover and a ferstory. Wetlands er riparian areas.  5  seach stream ban each by measurin 100% 1.1 100% 1.1 ried substrate si fifte poole completimal re typically present	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in the containing both and the containing both and containing both experience of the containing both experience of	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High 0.85  Calculators are provided in the care provided in th	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you  ginal	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5   NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.10		

	St	ream In	npact A	ssessm	ent For	m Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2	02080104	10/15/2015	02-STR-117b			
4. CHANNEL	ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of ch	nannel, channeliz	zation,	NOTES>>	Stream	
embankments, s	poil piles, constrictions, livestock		Conditiona	I Category				flows unde		
Channel Alteration	Negligible  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel		60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	00% of reach is y of the channel in the parameter DR 80% of banks bibion, riprap, or nent.	to other si	to other side of the tracks.	
SCORE	1.5	1.3	1.1	0.9	0.7		.5			0.90
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN					
NOTE: The CIs and R	CI should be rounded to 2 decimal places. T	he CR should be roun	ided to a whole number	er.				CONDITION IN		
								I= (Sum of all CION REQUIRE)		0
								X LF X IF	ILITI (OIL) >>	U
INSERT PHO	TOS:									
DESCRIBÉ F	PROPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11 Claiborne Run 02-STR-117b

Date: 10/15/2015	Project/Site: DC2RVA - Area 02	Latitude: 38.329056
Evaluator: D. Mitchell, M. Rockwell	County: Stafford	Longitude: -77.449356
<b>Total Points:</b> 38.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 18.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	2	(3)
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence	U	<u> </u>		3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	<u>(1)</u>	2	3
7. Recent alluvial deposits	0	T	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $8.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 11.5)	_			
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1. Other = 0	
*perennial streams may also be identified using other methods.	See p. 35 of manua	al.		
Notes: GPS 1 points labeled 06-STR-19-HR; D. Mito			OB closest to RR.	Stream 10
meets this stream. Field Sheet 06-STR-19 To	eam 2.			
	י בי מ	1		
Sketch:	Railroa	0		
[A]	8			
Het	A			
191	1			
191	SI	ream 19		
11				
1.1				

	St	ream A	SSESS			-	m 1)			
			n wadeable chan	nels classified a						
Project #	Project N	ame	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - A	rea 02	VA	R2	02080104	10/15/2015				
Nam	ne(s) of Evaluator(s)	Stream Nan	tream Name and Information							
D. Mit	tchell, M. Rockwell				02-ST	R-118				
I. Channel (	Condition: Assess the cros	s-section of the strea								
	Optimal	Subo	optimal	Conditional Catego Mar	ginal	Po	or	Sev	/ere	
	The state of the s	1			less than Severe or	Overwiden		1	5	
Channel Condition	Very little incision or active erosi 100% stable banks. Vegetat surface protection or natural n prominent (80-100%). AND// Stable point bars/bankfull ben are present. Access to their or floodplain or fully developed v bankfull benches. Mid-channel and transverse bars few. Transediment deposition covers less	n; 80 erosion or unproto of banks are Vegetative protein (R prominent (6 Depositional fersiality). The basic portions of the thorn of the portions of the protions of the prot	few areas of active acted banks. Majority stable (60-80%). ction or natural rock 0-80%) AND/OR atures contribute to ankfull and low flow ell defined. Stream to bankfull benches, ed floodplains along reach. Transient	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran instability. Depositi stability, may be	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by disent, contribute on that contribute to forming/present. ed channels have	widen further. Maj	ority of both banks crosion present on ks. Vegetative to 20-40% of fficient to prevent R 60-80% of the dby sediment. orary/transient in buting to instability. dc channels have	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious bank sl. Erosion/raw bar AND/OR Aggradin	on less than 20% of eventing erosion. oughing present. aks on 80-100%. g channel. Greater	
	10% of bottom.	strear	ers 10-40% of the n bottom.	vegetative protecti banks and depositi contribute	ion on > 40% of the ional features which to stability.	40% of the bar sediment depos	nks and stable sition is absent.	deposition, contrib Multiple thread subterran	channels and/or nean flow.	
Score	3		2.4		2	1.	6	1	1	
2. RIPARIA	N BUFFERS: Assess both	•	ian areas along the	,	ugh measuremer	its of length & wide	h may be accep	table)		
	Outimal							NOTES>>		
	Optimal	Sub	optimal	<del> </del>	ginal	Po	or	NOTES>> Perrenial s	tream	
Riparian Buffers	Tree stratum (dbh > 3 inches) pr with > 60% tree canopy cover a non-maintained understory. We located within the riparian are	High Suboptima Riparian areas with tree stratum (dbh > 3 inches) present, with 309 da ands ands containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal  Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking a hrub and tree stratum, hay production, ponds open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	Perrenial s flowing int 19.		
Buffers	Tree stratum (dbh > 3 inches) pr with > 60% tree canopy cover a non-maintained understory. We	High Suboptima Riparian areas with tree stratum (dbh > 3 inches) to 60% tree ands containing both herbaceous and shrub layers or non-maintained	Low Suboptimal  I: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	Perrenial s flowing int 19.		
Condition Scores  1. Delineate rip descriptors. 2. Determine so	Tree stratum (dbh > 3 inches) pr with > 60% tree canopy cover a non-maintained understory. We located within the riparian are	High Suboptima Riparian areas with tree stratum (dbh > 3 inches) resent, with 309 to 60% tree anopy cover ana containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  bank into Condition suring or estimating I	Low Suboptimal  It: Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Cotength and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	Perrenial s flowing int 19.	o Stream	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the %	Tree stratum (dbh > 3 inches) pr with > 60% tree canopy cover a non-maintained understory. We located within the riparian are  1.5  Parian areas along each stream quare footage for each by mea Riparian Area and Score for e % Riparian Area> Score > 1.2	High Suboptima Riparian areas with tree stratum (dbh > 3 inches) present, with 30° to 60% tree ands containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  bank into Condition suring or estimating leth riparian category	Low Suboptimal  It: Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Cotength and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  The sums iparian qual 100 100%	Perrenial s flowing int 19.	cores*0.01)/2	
Condition Scores  1. Delineate rip Jescriptors. 2. Determine so Delow. 3. Enter the %	Tree stratum (dbh > 3 inches) pr with > 60% tree canopy cover a non-maintained understory. We located within the riparian are  1.5  parian areas along each stream quare footage for each by mea Riparian Area and Score for e % Riparian Area > 100% Score > 1.2	High Suboptima Riparian areas with tree stratum (dbh > 3 inches) present, with 30° to 60% tree ands containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  bank into Condition suring or estimating leth riparian category	Low Suboptimal  It: Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Cotength and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	Perrenial s flowing int 19.  Cl= (Sum % RA * S Rt Bank Cl >	o Stream  cores*0.01)/2  1.20	
Condition Scores  1. Delineate rip descriptors. 2. Determine st poleow. 3. Enter the % Right Bank  Left Bank  3. INSTREA	Tree stratum (dbh > 3 inches) pr with > 60% tree canopy cover a non-maintained understory. We located within the riparian are  1.5  Parian areas along each stream quare footage for each by mea Riparian Area and Score for e % Riparian Area> Score > 1.2	High Suboptima Riparian areas with tree stratum (dbh > 3 inches) present, with 30% da ands ands ands succession of the suboptimal of the s	Low Suboptimal  Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Cotength and width. (in the blocks below the blocks below the course of the blocks below the course of the blocks below the course of the blocks below t	Mar  High Marginal: Non-meintained, wegetation with either a shrub layer or a tree layer (bhr > 3 layer (bhr > 3 layer) (bhr >	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds open water. If present, tree stratum (dbh 23 traches) present, with <30% tree canopy cover with maintained understory. Low 0.75 sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Les sums iparian qual 100 100%	Perrenial s flowing int 19.	cores*0.01)/2	
Condition Scores  1. Delineate rip descriptors. 2. Determine st colou. 3. Enter the % Right Bank Left Bank  Left Bank Instream	Tree stratum (dbh > 3 inches) pr with > 60% tree canopy cover a non-maintained understory. We located within the riparian are  1.5  parian areas along each stream quare footage for each by mea  Riparian Area and Score for e % Riparian Area> 100% Score > 1.2  % Riparian Area> 100% Score > 1.2  M HABITAT: Varied substr	High Suboptima Riparian areas with tree stratum (dbh > 3 inches) resent, with 309 to 60% tree acompty cover and subsequence of the subsequence and shrub layers or a non-maintained understory.  High 1.2 bank into Condition suring or estimating I ach riparian category  testing subsequence testing subsequenc	Low Suboptimal  Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Cotength and width. (in the blocks below the blocks below the course of the blocks below the course of the blocks below the course of the blocks below t	Mar  High Marginal: Non-maintained, vegetation with either a shrub layer or a tree layer or a tree layer or a tree layer or a tree canopy cover.  High  0.85  Calculators are pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds open water. If present, tree stratum (dbh 23 traches) present, with <30% tree canopy cover with maintained understory. Low 0.75 sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	Perrenial s flowing int 19.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	o Stream  cores*0.01)/2  1.20	
Condition Scores  1. Delineate rip descriptors. 2. Determine st pelow. 3. Enter the % Right Bank Left Bank  Left Bank  3. INSTREA	Tree stratum (dbh > 3 inches) pr with > 60% tree canopy cover a non-maintained understory. We located within the riparian are  1.5  parian areas along each stream quare footage for each by mea Riparian Area and Score for e % Riparian Area > 100% Score > 1.2  M Riparian Area> 100% Score > 1.2  M HABITAT: Varied substr ; root mats; SAV; riffle poole c	High Suboptima Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree ands containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  bank into Condition suring or estimating la tch riparian category  atte sizes, water veloc implexes, stable feat  Subo  Stable habitat el	coptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 3 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Covered and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, Von-maintained,	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds open water. If present, tree stratum, of the stratum, hay make the stratum of the stratu	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to descript the seeded and stabilized the seeded and stabilized and stabi	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  The sums iparian qual 100 100%  100%  100%  100%  Interpretable conditions  Interpretable conditions  Interpretable conditions  Low Interpretable conditions  Of listed above are	Perrenial s flowing int 19.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	o Stream  cores*0.01)/2  1.20	
Condition Scores  1. Delineate rip Descriptors. 2. Determine su Delow. 3. Enter the % Right Bank  Left Bank  3. INSTREA Undercut banks  Instream Habitat/	Tree stratum (dbh > 3 inches) privith > 60% tree canopy cover a non-maintained understory. We located within the riparian are located within the riparian are salong each stream quare footage for each by mea stream footage for each by mea stream Area and Score for e % Riparian Area 100% Score > 1.2  % Riparian Area 100% Score > 1.2  M HABITAT: Varied substreet in the stream of t	High Suboptima Riparian areas with tree stratum (dbh > 3 inches) present, with 309 to 60% tree nods cappy cover and containing both herbaceous and skrub layers or a non-maintained understory.  High 1.2  bank into Condition suring or estimating l toch riparian category  tet sizes, water veloc implexes, stable feat  Subo Stable habitat el present in 30-56, area dequate f and adequate f	Deptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coverency and width. (dispending to the blocks below the bl	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) research with <30% tree canopy cover.  High  0.85  Calculators are provided at Category  Mar  Stable habitat ele present in 10-30 are adequate for are shown are decayed to the control of t	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds open water. If present, tree stratum, consider the stratum, and the stratum, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  ate; low embeded	Low Poor: Impervious Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%  100%	Perrenial s flowing int 19.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	o Stream  cores*0.01)/2  1.20	

	St	ream In	npact A	ssessm	ent For	rm Pag	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2	02080104	10/15/2015	02-STR-118			
4. CHANNEL	L ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of ch	hannel, channeli	zation,	NOTES>>	•	
embankments, s	poil piles, constrictions, livestock		Conditiona	Il Category						
	Negligible	Mir	nor		erate	Ser	/ere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/6 shored with ga	80% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or nent.			
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			1.50
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IIS REACH			
NOTE: The CIs and R	RCI should be rounded to 2 decimal places. T	he CR should be roun	ded to a whole numb	er.				CONDITION IN		
								I= (Sum of all C		0
						<u> </u>		I X LF X IF	(011) //	U
INSERT PHO	OTOS:									
DESCRIBE F	PROPOSED IMPACT:									
DESCRIBE F	PROPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11

02-STR-118

Date: 10/15/2015	Project/Site: DC2RVA - Area 02	Latitde: 38.330272
Evaluator: D. Mitchell, M. Rockwell	County: Stafford	Longitude: -77.448864
<b>Total Points:</b> 36 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 18)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	2	(3)
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence	-	-		_
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	8	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 7				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	<u>0</u>	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = $11$ )	<b>'</b>			
18. Fibrous roots in streambed	<u>3</u>	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1. Other = 0	
*perennial streams may also be identified using other method:	s. See p. 35 of manua	al.		
Notes: Field Sheet 06STR-20 Team 2.	1 4	CAPPELLE	10	
	,/-	stream	1.1	<del></del>
728. 984.23. 994.23				
Sketch:	1			
		-		
		1		
		/		
		Stream	20	
		STAGMAI	40	
			1	
			1	

	Ephe	emera		ified Stream	Methodology	sment I		(Forn	າ 1a)	
Project #	F	Project Name	•	Locality	cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC	2RVA - Area	03	VA	R6	02080104	10/15/2015			1
	e(s) of Evaluat		Stream Name	e and Informa	ation	02 CT	D 04			
D. Milt	tchell, M. Rocl	kweli				03-ST	K-U1			
2. RIPARIAN	N BUFFERS: A	ssess both bank	's 100 foot ripariar	n areas along the	entire SAR. (roug	gh measurements of le	ength & width may	be acceptable)		
	Ontio	mal		nditional Cat		arainal	D <sub>C</sub>		NOTES>>	Field
Riparian Buffers	Optil  Tree stratum (dbh > with > 60% tree can non-maintained und area	3 inches) present, lopy cover and an erstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	Sheet 06STF 2	R16 Team
Condition	1.5	<u> </u>	High 1.2	1.1	High 0.85	0.75	High 0.6	0.5		
Scores										
2. Determine squ	iparian Area and S	nch by measuring Score for each rip	or estimating len	gth and width. Ca	alculators are prov	ng the descriptors.	of % F	Riparian equal 100		
Right Bank	% Riparian Area>	50% 1.1	50% 0.85					100%		
			0.00						CI= (Sum % RA * Sc	ores*0.01)/2
Left Bank	% Riparian Area>	50% 1.1	50% 0.85					100%	Rt Bank CI >	0.98
	Score >			INDEX and	STREAM CO	ONDITION UNIT	C EOD TUIC	BEACH	LI Balik Ci >	0.98
VOTE: The CIs and R	RCI should be rounded					SINDITION ONLI			ONDITION IND	EX (RCI) >>
VOTE: The CIs and R	RCI should be rounded					SADITION ONL		THE REACH O	CONDITION INDI	, ,
NOTE: The CIs and R	RCI should be rounded					ONDITION ONLY		THE REACH O RC COMPENSATI	l= (Riparian CI)/2 ON REQUIREM	2
						SNDITION GNIT		THE REACH O RC COMPENSATI	l= (Riparian CI)/2	2
INSERT PHO		to 2 decimal places.						THE REACH O RC COMPENSATI	l= (Riparian CI)/2 ON REQUIREM	2
INSERT PHO	DTOS:	to 2 decimal places.						THE REACH O RC COMPENSATI	l= (Riparian CI)/2 ON REQUIREM	2
INSERT PHO	DTOS:	to 2 decimal places.						THE REACH O RC COMPENSATI	l= (Riparian CI)/2 ON REQUIREM	2
INSERT PHO	DTOS:	to 2 decimal places.						THE REACH O RC COMPENSATI	l= (Riparian CI)/2 ON REQUIREM	2

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 10/15/2015

03-STR-01

Latitde: 38.325459

Date: 10/15/2015	Froject/Site. DC/	ZIVA AICA 00	Latitue. 30.32	20400
Evaluator: D. Mitchell, M. Rockwell	County: Stafford		Longitude: -77	.450294
<b>Total Points:</b> 9.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) mittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 4)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	(0)	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	$\bigcirc$	2	3
5. Active/relict floodplain		9	2	3
6. Depositional bars or benches	(P)	1	2	3
7. Recent alluvial deposits		1	2	3
8. Headcuts	0	1)	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes =	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 1.5				
12. Presence of Baseflow	<u>Q</u>	1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes =	= 3
C. Biology (Subtotal = $\underline{4}$				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks		1	2	3
22. Fish		0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0)	0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1. Other = 0	
*perennial streams may also be identified using other methods	s. See p. 35 of manual			
Notes: Field Sheet 06-STR-16 Team 2.				
Sketch: Sketch: Mar	hole )	RR		

		Stre	Uni	fied Stream N	lethodology f	or use in Virg		m 1)			
Project #		Project Name		wadeable chan  Locality	Classified a	s intermittent or HUC	Date Date	SAR#	Impact/SAR	Impact	
N/A	DC	2RVA - Area	03	VA	Class.	02080104	N/A		length	Factor	
Name	e(s) of Evaluator(s) Stream I			e and Informa	ation						
F	R. Chojnacki				03-S	TR-02 (	Claiborne	Run)			
1. Channel C	ondition: Asse	ess the cross-sec	ction of the stream								
	Opti	imal	Subo	ptimal	Conditional Catego Mar	ry ginal	Po	or	Sev	ere	
	- Lev		1			less than Severe or	Overwiden		5		
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or full) bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ess to their original of developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are stogetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to or newly develope	ew areas of active table (60-80%). tion or natural rock -80%) AND/OR urres contribute to okfull and low flow Il defined. Stream o bankfull benches, d floodplains along each. Transient	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe were bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj are near vertical. I 60-80% of ban protection prese banks, and is insu erosion. AND/O stream is cover	ority of both banks Frosion present on ks. Vegetative int on 20-40% of ufficient to prevent R 60-80% of the ed by sediment. porary/transient in buting to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/undercr protection present obanks, is not pre Obvious bank sle Erosion/raw ban	stability. Severe tained within the ed below average apority of banks cut. Vegetative on less than 20% of eventing erosion. bughing present. iks on 80-100%.	
	sediment deposition 10% of		sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the ba	ion is present on > nks and stable		channels and/or	С
Score	3			.4	I	2	1.		tion in this t		2.0
2. RIPARIAN	I BUFFERS: A	Assess both bank		an areas along the	,	ugh measuremen	ts of length & wid	th may be accep	ntable)		
	Opti	imal	Subo	ptimal	Mar	ginal	Po	or			
Riparian Buffers	with > 60% tree ca	derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopu cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Condition			High	Low	High	Low	High	Low			
Condition Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
descriptors. 2. Determine squelow.	arian areas along uare footage for e Riparian Area and	each by measurin	g or estimating le	ngth and width. (	Calculators are pr		of % R	he sums tiparian qual 100			
Right Bank	% Riparian Area>	100% 1.2						100%			
	300.07	1.2							CI= (Sum % RA * S	cores*0.01)/2	
	% Riparian Area>	80% 1.1	30% 0.5					110%	Rt Bank CI >	1.20 1.03	CI 1.1
Left Bank			0.5						LI DafIK CI >	1.03	1.1.
3. INSTREAM	Score >  ## HABITAT: Varoot mats; SAV; r	aried substrate si		res.		oris; stable substr	ate; low embeded	Iness; shade;	NOTES>>		
3. INSTREAM undercut banks; Instream	/ HABITAT: Va	aried substrate si iffle poole comple	exes, stable featu		al Category				NOTES>>		
3. INSTREAM undercut banks;	// HABITAT: Varoot mats; SAV; r	aried substrate si iffle poole comple imal re typically present	Subo Stable habitat ele present in 30-50% are adequate fo	res. Conditiona	Mar Stable habitat ele present in 10-30% are adequate fo	ginal ments are typically % of the reach and r maintenance of ations.	Pc Habitat elements lacking or are u	s listed above are nstable. Habitat ally present in less			C

	St	ream In	npact A	ssessm	ent For	m Pag	e 2			
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2	02080104	10/15/2015	03-STR-02			
4. CHANNEL	L ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of ch	hannel, channeliz	zation,	NOTES>>		
embankments, s	poil piles, constrictions, livestock		Conditiona	I Category						
	Negligible	Mir	nor	Mod	erate	Sev	vere vere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0 shored with ga	10% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or lent.			
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			0.70
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN					
NOTE: The CIs and R	RCI should be rounded to 2 decimal places. T	The CR should be roun	ded to a whole numb	er.				CONDITION IN I= (Sum of all C		
								ON REQUIRE		0
								I X LF X IF	(- )	•
INSERT PHO	TOS:									
DESCRIBE F	PROPOSED IMPACT:									

03-STR-02 Claiborne Run NC DWO Stream Identification Form Version 4.11 Date: 07/22/2016 Project/Site: DC2RVA-Segment 6 Latitude: 38,323953 Evaluator: L. Postaski, R. Magnum County: Stafford Longitude: -77.450686 Total Points: 43 Stream Determination (circle one) Other Stream is at least intermittent Ephemeral Intermitten Perennial e.g. Quad Name: if ≥ 19 or perennial if ≥ 30\* **Absent** Weak Moderate Strong A. Geomorphology (Subtotal = 24.51<sup>a.</sup> Continuity of channel bed and bank 0 3 2 2. Sinuosity of channel along thalweg 0 1 2 3 3. In-channel structure: ex. riffle-pool, step-pool, 0 2 1 3 ripple-pool sequence 3 4. Particle size of stream substrate 0 1 2 5. Active/relict floodplain 0 1 3 2 6. Depositional bars or benches 0 1 3 2 7. Recent alluvial deposits 0 1 3 8. Headcuts 2 3 0 1 (0.5)9. Grade control 0 1 1.5 10. Natural valley 1.5 0 0.5 11. Second or greater order channel No = 0Yes = 3 artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 1012. Presence of Baseflow 0 1 3 13. Iron oxidizing bacteria 0 3 1 14. Leaf litter (1.5)1 0.5 0 15. Sediment on plants or debris 0.51 1.5 16. Organic debris lines or piles 1 0 0.5 1.5 17. Soil-based evidence of high water table? No = 0Yes = 3C. Biology (Subtotal = 8.518. Fibrous roots in streambed 2 0 3 19. Rooted upland plants in streambed 2 0 1 20. Macrobenthos (note diversity and abundance) **(**1) 2 3 0 0 21. Aquatic Mollusks 2 3 1 22. Fish 1.5 0 0.51 23. Crayfish 0 1 1.5 24. Amphibians 0.5 0 1 1.5 25. Algae  $\bigcirc$ 0.5 1.5 26. Wetland plants in streambed FACW = 0.75; OBL = 1.5 Other = 0\*perennial streams may also be identified using other methods. See p. 35 of manual. Notes: This is Claiborne Run. 6-STR-1 Sketch:

		Sue	am A	SSESS fied Stream M			_	-			
<b>D.</b> 1		Danie (1)		wadeable chan	nels classified a			0.15	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA e and Informa	R2SB3	02080104	10/15/2015				
	e(s) of Evalua tchell, M. Ro	. ,	Stream Nam	e and informa	ation	03-5	ΓR-03	 '₽-03			
	Condition: Asse		tion of the stream	n and prevailing c	ondition (erosion.		11. 00				
	Opti				onditional Catego		Po	or	Sou	/ere	
	- Opti	illiai	Jubo	pumai	IVIAI	giriai	N P	OI	361	//	
		- HAND	T.			less than Severe or	Overwiden		1	5	
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches.	n or natural rock, 00%). AND/OR bankfull benches as to their original developed wide Mid-channel bars,	erosion or unproted of banks are s Vegetative protect prominent (60- Depositional feat stability. The bar channels are we likely has access to	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow all defined. Stream o bankfull benches, to floodplains along	or Poor due to lo Erosion may be pro both banks. Vegel 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the by sediment. orary/transient in	vertical/lateral in incision, flow cor banks. Streambe rooting depth, n vertical/underc protection present banks, is not pre	(or excavated), stability. Severe takined within the ed below average najority of banks tut. Vegetative on less than 20% of eventing erosion. oughing present.	
	and transverse be sediment deposition 10% of	n covers less than	portions of the r sediment cover	reach. Transient rs 10-40% of the bottom.	stability, may be AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the onal features which to stability.	AND/OR V-shap vegetative protecti 40% of the bar sediment depos	ed channels have on is present on > oks and stable	AND/OR Aggradin than 80% of stream deposition, contrib	g channel. Greater in bed is covered by outing to instability. channels and/or	C
Score	3	3	2	2.4	:	2	1.	6		1	2
. RIPARIAI	N BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro			th may be accep			
2. RIPARIAI	N BUFFERS: A		Con	an areas along the ditional Categorimal	gory			h may be accep			
RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	ts of length & wid	h may be accep	notes>>		
Riparian	Option  Tree stratum (dbh with > 60% tree canon-maintained und	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with +30% tree canopy cover with	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious spoil lands, denuded surfaces, row crops, active feed lots, trails, or	notes>>		
Riparian Buffers	Option  Tree stratum (dbh with > 60% tree canon-maintained und	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	ts of length & wid  Pc  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	notes>>		
Riparian Buffers  Condition Scores  Delineate rip lescriptors. 2. Determine so	Tree stratum (dbh : with > 60% tree conon-maintained un located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream baniach by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorian Categorian Categories and Coungth and width. Categorian and Categorian Categorian and Categ	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	notes>>		
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow.	Tree stratum (dbh with > 60% tree conon-maintained un located within the located within t	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream baniach by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorian Categorian Categories and Coungth and width. Categorian and Categorian Categorian and Categ	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	notes>>		
Riparian Buffers  Condition Scores  Delineate riplescriptors.	Tree stratum (dbh with > 60% tree conon-maintained un located within the located within t	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5.5  each stream bank each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating leparian category in	ditional Categorian Categorian Categories and Coungth and width. Categorian and Categorian Categorian and Categ	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	NOTES>>		
Riparian Buffers  Condition Scores  Delineate rip descriptors. Determine scelow. Enter the % Right Bank	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5.5  each stream bank each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 25%	ditional Categorian Categorian Categories and Coungth and width. Categorian and Categorian Categorian and Categ	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	notes>>	cores*0.01)/2	C
Riparian Buffers  Condition Scores  Delineate rip lescriptors. Determine scelow.	Tree stratum (dbh : with > 60% tree cc non-maintained una located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream bani each by measurin Score for each ri 75% 1.2	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.85	ditional Categorian Categorian Categories and Coungth and width. Categorian and Categorian Categorian and Categ	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	table)  NOTES>>  Cl= (Sum % RA * S		C 1.1
Riparian Buffers  Condition Scores  Delineate rip lescriptors. Determine scoelow. Right Bank  Left Bank  B. INSTREAL	Tree stratum (dbh : with > 60% tree cc conon-maintained und located within the located wi	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bani each by measurin 75% 1.2 75% 1.2 aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.85	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained arna stabilized, or other comparable condition.  High  O.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	table)  NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	1.11	
Condition Scores  Delineate rip lescriptors. Descriptors. Enter the % Right Bank  Left Bank  Left Bank  INSTREAL	Tree stratum (dbh a with a 60% tree conon-maintained una located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bani each by measurin 75% 1.2 75% 1.2 aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.85	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provinced to the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained arna stabilized, or other comparable condition.  High  O.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	1.11	
Riparian Buffers  Condition Scores  Delineate rip lescriptors. Determine scoelow. Right Bank  Left Bank  B. INSTREAL	Tree stratum (dbh : with > 60% tree cc conon-maintained und located within the located wi	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bank each by measurin 75% 1.2  75% 1.2  aried substrate si iffle poole complete.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.85  25% 0.85  zes, water velocit exes, stable featu	ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (count the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the control of the con	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>20</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 1005  Low 1006  Low 1007   Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	1.11		
Condition Scores  Delineate rip elescriptors. Determine scoelow. Enter the % Right Bank  Left Bank  Left Bank  Instream Habitat/ Available	Tree stratum (dbh with > 60% tree conon-maintained und located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream bankeach by measurin 75% 1.2 75% 1.2 aried substrate si iffle poole completimal re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.85  25% 0.85  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Counth the blocks below t	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically 6 of the reach and	ts of length & wid  PC  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- moderate and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e  Habitat elements lacking or are un	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	table)  NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >  NOTES>>	1.11	
Condition Scores  Delineate rip lescriptors. Descriptors. Ender the % Right Bank  Left Bank  Left Bank  Instream Habitat/	Tree stratum (dbh : with > 60% tree cc conon-maintained und located within the located wi	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bani each by measurin  75%  1.2  75%  1.2  aried substrate si iffle poole completified poole completified poole completified by the completified poole completified poole completified by of the reach.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.85  25% 0.85  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ingth and width. (in the blocks below  ty and depths; wo res.  Conditiona ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present. The present, tree stratum (dbh > 3 inches) present. The present tree stratum (dbh > 3 inches) present. The present tree stratum (dbh > 3 inches) present tree stratum (dbh >	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%  101%	table)  NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >  NOTES>>	1.11	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor CSX R2SB3 02080104 10/15/2015 03-STR-03 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> Some embankments, spoil piles, constrictions, livestock Conditional Category Moderate channalization present near culvert. Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. SCORE 1.5 1.3 1.1 0.9 0.7 0.5 1.30 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View upstream toward culvert under railroad **Bottom Right: View downstream** from railroad



NC DWO Stream Identification Form Version 4.11

03-STR-03

THE DIVY Stream Identification Form	V CI SIUII T.II	
Date: 10/15/2015	Project/Site: DC2RVA - Area 03	Latitde: 38.322433
Evaluator: D. Mitchell, M. Rockwell	County: Stafford	Longitude: -77.449959
<b>Total Points:</b> 36 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:
•		

if ≥ 19 or perennial if ≥ 30*	Epnemeral Inte	rmittent Perenn	e.g. Quad Name:	
A. Geomorphology (Subtotal = 17)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	<b>(1)</b>	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $8.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = $10.5$		_		
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)		1	(2)	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5

<u></u> /				
18. Fibrous roots in streambed	3_	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)		1	(2)	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other = 0	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet 06STR-17 Team 2.

Sketch:

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Impact Cowardin Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A ۷A 02080104 10/15/2015 DC2RVA - Area 03 R6 Name(s) of Evaluator(s) Stream Name and Information D. Mitchell, M. Rockwell 03-STR-04 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Railroad small ditch Low Marginal: Non-maintained flowing into Stream High Poor: ow Suboptima High Suboptimal Riparian areas with tree stratum Riparian areas with tree stratum High Marginal: Non-maintained, nse herbaceou 17. Field Sheet and maintained vegetation, areas, nurseries Impervious 06STR-18 Team 2. (dbh > 3 inches) ense herbaceou riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine vegetation with either a shrub layer or a tree present, with 30% tree canop lacking shrub and tree stratum, hay Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands esent, with 30% to 60% tree actively grazed pasture, sparsely spoil lands, enuded surface Riparian canopy cover and containing both herbaceous and shrub layers or a non-maintained open water. If present, tree stratum (dbh >3 cover and a **Buffers** vegetated nonrow crops, active maintained laver (dbh > 3 areas maintained area eed lots, trails, or understory. Recent cutove inches) present with <30% tree recently seeded and stabilized, or ther comparable conditions. (dense canopy cover. inches) present, other comparable vegetation). with <30% tree understory. condition. anopy cover wit maintained High Low High Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores areas along each stream bank into Condition Categories and Condition Scores using the Delineate Ensure the sums . Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank 0.85 Score > CI= (Sum % RA \* Scores\*0.01)/2 100% 100% Rt Bank CI > CI 0.85 % Riparian Area> Left Bank 0.85 Lt Bank CI > 0.85 0.85 Score >

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

OTE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH

THE REACH CONDITION INDEX (RCI) >> 0.43

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

INSERT PHOTOS:



Typical view of strea

NC DWQ Stream Identification Form Version 4.11

03-STR-04

Date: 10/15/2015	Project/Site: DC	C2RVA-Segment 06	Latitde: 38.32	22319
Evaluator: D. Mitchell, M. Rockwell	County: Staffor	d	Longitude: -77	'.449831
<b>Total Points:</b> 15.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 3.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	( <u>0</u> )	1	2	3
7. Recent alluvial deposits	Image: Control of the	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley		0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 6.75)	<u>'</u>	<u> </u>		
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	M	1	2	3
21. Aquatic Mollusks	6	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish		0.5	1	1.5
24. Amphibians		0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OBI	_ = 1.5 Other = 0	)
*perennial streams may also be identified using other method	ods. See p. 35 of manua	al.		
Notes: Field Sheet 06STR-18 Team 2.		order Assert	1	
	_	Stream 17		
Sketch:	of X		1	ream 18
	Ch 2	/ `	J 51	

		Stre	Uni	fied Stream N	lethodology f	or use in Virg		m 1)			
Drainet #		Project Name		wadeable chan	nels classified a Cowardin			CAD#	Impact/SAR	Impact	
Project #		•		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R2UB	02080104	09/01/2016				
	e(s) of Evaluat pering, L. Po	` '	Stream Nam	e and Informa		TD_05 /	Claiborne	D.m.\			
	ondition: Asse		tion of the atroop	and provoiling o			Ciaiborne	: Kuli)			
Chainer				C	onditional Catego	ry					
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	1	- MAKE	Slightly incircut f	ew areas of active		less than Severe or	Overwidene		Deeply incised	(or excavated).	
Channel Condition	Very little incision or 100% stable bar surface protectior prominent (80-11 Stable point bars/l are present. Acce floodplain or fully	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ss to their original	erosion or unprote of banks are s Vegetative protec prominent (60 Depositional feal stability. The ban channels are we	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow Il defined. Stream	or Poor due to lo Erosion may be pri both banks. Vegei 40-60% of banks. bevertical or unde 60% of strean sediment. Sec	esent on 40-60% of tative protection on Streambanks may crcut. AND/OR 40- n is covered by diment may be	Vertically/laterally widen further. Maji are near vertical. E 60-80% of banl protection preser banks, and is insu erosion. AND/OF stream is covered	ority of both banks crosion present on ks. Vegetative on 20-40% of fficient to prevent a 60-80% of the ed by sediment.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre	stability. Severe stained within the ed below average najority of banks ut. Vegetative on less than 20% of	
	bankfull benches. and transverse ba sediment depositio 10% of I	Mid-channel bars, ars few. Transient n covers less than	or newly develope portions of the sediment cover	o bankfull benches, d floodplains along reach. Transient rs 10-40% of the bottom.	instability. Deposition stability, may be AND/OR V-shap vegetative protecti banks and depositi	sient, contribute on that contribute to forming/present. ed channels have on on > 40% of the onal features which to stability.	Sediment is temp nature, and contrib AND/OR V-shape vegetative protecti 40% of the bar sediment depos	outing to instability. ed channels have on is present on > nks and stable	Erosion/raw ban AND/OR Aggradin than 80% of stream	ks on 80-100%. g channel. Greater bed is covered by uting to instability. channels and/or	CI
Score	3			.4		2	1.		riginal Field		2.0
lar	-			ditional Cate					NOTES>>		
	Opti	mal	Subo	ptimal	Mar	ginal Low Marginal:	Po	or	Riparian are	ea is	
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	nopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
0 1141			High	Low	High	Low	High	Low			
Condition Scores	1.	5	1.2	1.1	0.85	0.75	0.6	0.5			
scriptors. Determine square low. Enter the % R	uare footage for e Riparian Area and Riparian Area>	ach by measurin	g or estimating le	ngth and width. (	Calculators are pr	Ü	Ensure the of % R	iparian			
Right Bank	Score >	0.85						. 55 /6			
	% Riparian Area>	60%	40%					100%	CI= (Sum % RA * S Rt Bank CI >	cores*0.01)/2 0.85	CI
	/v INIPAHAH AIRd>	0070	4070					10076	Lt Bank CI >		0.90
Left Bank	Score >	0.85	1.1							0.95	
INSTREAM	Score > // HABITAT: Varoot mats; SAV; ri	aried substrate si	zes, water veloci	res.		oris; stable substr	ate; low embeded	ness; shade;	NOTES>>	0.95	
INSTREAM dercut banks; Instream	<b>/I HABITAT:</b> ∀a	aried substrate si iffle poole comple	zes, water veloci exes, stable featu		I Category	pris; stable substr	ate; low embeded			0.95	
	// HABITAT: Va	aried substrate si ffle poole comple mal re typically present	zes, water velociexes, stable featue  Subo  Stable habitat ele present in 30-50° are adequate fo	res. Conditiona	Stable habitat ele present in 10-30% are adequate fo			Or listed above are astable. Habitat ally present in less	NOTES>>	0.95	CI

	St	ream In	npact A	ssessm	ent For	rm Page	<b>2</b>		
Project#	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	csx	VA	R2UB	02080104	09/01/2016	03-STR-05			
	ALTERATION: Stream cross poil piles, constrictions, livestock Negligible		crete, gabions, or  Conditiona	I Category	straightening of ch	hannel, channeliz		NOTES>> Near Butler Grade conti	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel	60 - 80% of reach		0% of reach is of the channel in the parameter R 80% of banks bion, riprap, or	present on of the strea	
	1.5	1.3	1.1	0.9	0.7	0.		1	

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Typical view of stream facing railroad bridge Bottom Rigjt: Typical view of stream



NC DWQ Stream Identification Form Version 4.11 Claiborne Run 03-STR-05

110 B W Q Bu cam Identification Form V	CI SIOII 4.11	00 01110
Date: 09/01/2016	Project/Site: DC2RVA - Area 03	Latitude: 38.315376
Evaluator: L. Eggering, L. Postaslo	County: Stafford	Longitude: -77.448994
<b>Total Points:</b> 39 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 19)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	N	o = 0	Yes:	= 3)
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $8$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	= 3
C. Biology (Subtotal = 12 )				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	(1)	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	(1)	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other methods.	. See p. 35 of manu	al.		
Notes: This is Claiborne Run. Substrate is a mix of	f sand and cobb	le. Original Field	Sheet: 7-A-STR-01	(rework)
				· ,
Sketch:		\$ \$ \frac{1}{2}		
Forest	4	/		

		Stre	Uni	fied Stream M		or use in Virg	ginia	··· · <i>,</i>			
Project #		Project Name		wadeable chan	Cowardin	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact	
N/A		2RVA - Area		VA	Class. R2SB3	02080104	11/04/2015		length	Factor	
	ne(s) of Evaluat			e and Informa		1	1 11 11 11 11 11				
L. Egg	jering, W. Mo	orhead				03-STR	-06 & 07	7			
. Channel (	Condition: Asse	ess the cross-sec	tion of the stream		ondition (erosion,						
	Opti	mal	Subo	ptimal		ginal	Po	or	Sev	vere	
		مرید مملا		~		less than Severe or	Overwiden		1	5	
Channel Condition	Very little incision of 100% stable bar surface protection prominent (80-11 Stable point bars/l are present. Acce floodplain or fully bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches as to their original of developed wide Mid-channel bars,	erosion or unproted of banks are stylegetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to or newly develope	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow III defined. Stream o bankfull benches, defloodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe were bank slopes. seent on 40-60% of tative protection on Streambanks may rerut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to formind/oresent.	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. orary/transient in buting to instability.	incision, flow cor banks. Streambe rooting depth, rr vertical/underc protection present of banks, is not pre Obvious bank sla Erosion/raw bar	stability. Severe tained within the ed below average najority of banks tut. Vegetative on less than 20% of veventing erosion. bughing present. iks on 80-100%.	
	sediment deposition 10% of I		sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bal sediment depos	on is present on > nks and stable		channels and/or	CI
Score	3	3	2	2.4		2	1.	6	1	ı	2.0
lar											
Mar	Opti	mal		ditional Cate ptimal		ginal Low Marginal:	Po	or	NOTES>>		
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy		Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, minds, spoil lands, denuded surfaces, row crops, active feed lots, tralls, or other comparable conditions.	NOTES>>		
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Dtimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a href="https://doi.org/10.100/bit/30/">https://doi.org/10.100/bit/30/"&gt;https://doi.org/10.100/bit/30/</a>	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>>		
Riparian	Tree stratum (dbh > with > 60% tree ca	• 3 inches) present, anopy cower and a derstory. Wetlands e riparian areas.	Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	Mary High Marginal: Non-maintained, one-mehaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>		
Riparian Buffers  Condition Scores  Delineate rip lescriptors.	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the	3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the conditio	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>		
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow.	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the conditio	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>		
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine so	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	- 3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the conditio	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5		cores*0.01\/2	
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow. Enter the %  Right Bank	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	3 inches) present, anopy cover and a detestory. Weltands e riparian areas.  5  each stream band ach by measurin Score for each ripsown in the stream is the	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the conditio	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	cores*0.01)/2 <b>0.63</b>	CI
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine scelow.	Tree stratum (dbh > with > 60% tree can non-maintained unc located within the located wit	5  sach stream bani ach by measurin Score for each ri 50% 0.75	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.5	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition of the conditio	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	CI= (Sum % RA * S		CI 0.63
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine selow. Enter the % Right Bank  Left Bank	Tree stratum (dbh > with > 60% tree canon-maintained mid no located within the located wi	5 sach stream bani ach by measurin 50% 0.75 50% 0.75 aried substrate si	Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.5	ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ingth and width. (in the blocks below  ty and depths; wo	Mary High Marginal: Non-maintained, dense harbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) grows a shrub layer or a tree layer (dbh > 3 inches) grows a shrub layer or a tree layer (dbh > 3 inches) grows a shrub layer or a tree layer (dbh > 3 inches) grows a shrub layer or a tree layer (dbh > 3 inches) grows a shrub layer (dbh > 3 inches) grows a s	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	C⊫ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	0.63 0.63	
Condition Scores  Delineate rip lescriptors. Determine scelow. Right Bank  Left Bank  Left Bank  Left Bank	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	5 sach stream bani ach by measurin 50% 0.75 50% 0.75 aried substrate si	Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.5	ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ingth and width. (in the blocks below  ty and depths; wo	High Marginal: Non-maintained, Vene a hind in the result of the result o	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	C⊫ (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>> Decent look	0.63 0.63 cing habitat,	
Riparian Buffers  Condition Scores  Delineate rip lescriptors. Determine soletow. Enter the % Right Bank  Left Bank  B. INSTREA	Tree stratum (dbh > with > 60% tree canon-maintained mid no located within the located wi	5  sach stream bank ach by measurin 50% 0.75  50% 0.75  aried substrate siffle poole comple	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.5  50% 0.5  zes, water velocii exes, stable featu	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Cover and a company and cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicate the canopy cover.  Calculators are provided the condition of the c	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you  pris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	C⊫ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	0.63 0.63 cing habitat,	
Condition Scores  Delineate rip lescriptors. Determine scelow. Enter the % Right Bank  Left Bank  Instream Habitat/ Available	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	5  sach stream bank ach by measurin 50% 0.75  50% 0.75  aried substrate siffle poole completimal re typically present	Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in 50%  0.5  50%  0.5  zes, water velocitiexes, stable feature Subo Stable habitat ele present in 30-50%	ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ongth and width. Co n the blocks below  ty and depths; wo res.  Conditiona ptimal ments are typically % of the reach and	High Marginal: Non-maintained, Vegetation with either a shrub layer or a tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the second of the second	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically % of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%  100%  Ilisted above are stable. Habitat	Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl> NOTES>> Decent look except for e banks in pla Railroad cu	0.63 0.63 cing habitat, eroding aces.	0.63
Riparian Buffers  Condition Scores  Delineate rip lescriptors. Determine scelow. Enter the % Right Bank  Left Bank  Instream Habitat/	Tree stratum (dbh > with > 60% free canon-maintained unclocated within the located within	5  sach stream banl ach by measurin 50% 0.75  saried substrate si iffle poole comple imal re typically present 0% of the reach.	Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.5  2es, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ongth and width. Co on the blocks below ty and depths; wo res.  Conditiona ptimal ments are typically	High Marginal: Non-maintained, wegetation with either a shrub layer or a tree layer (3bh > sal inversible sal i	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100  100%  100%  or listed above are stable. Habitat liby present in less the reach.	Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>> Decent look except for e banks in pla	0.63 0.63 cing habitat, eroding aces.	

	Applicant  CSX  ALTERATION: Stream crossi		Locality VA	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
4. CHANNEL A	ALTERATION: Stream crossi		VA	DOCDO				O/ ii t iongin	impact ractor
				R2SB3	02080104	11/04/2015	03-STR-6/7		
	oil piles, constrictions, livestock	ings, riprap, conci		concrete blocks, s	straightening of ch			NOTES>> Culverted sect	
	Negligible	Mir	nor		erate	Sev	ere	slope.	.1011 01
Aiteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		0% of reach is of the channel in the parameter R 80% of banks bion, riprap, or	G.Spo.	
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

### INSERT PHOTOS:



NC DWQ Stream Identification Form Version 4.11

### 03-STR-06 & 07

Date: 11/04/2015	Project/Site: DC2RVA - Area 03	Latitude: 38.315712
Evaluator: L. Eggering, W. Moorhead	County: Stafford County	Longitude: -77.448214
<b>Total Points:</b> 41.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 20)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual	<u>.</u>			
B. Hydrology (Subtotal = $10.5$				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	= 0	Yes:	= 3
C. Biology (Subtotal = 11 )	•	_		
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	<b>(3)</b>	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other metho	ds. See p. 35 of manual			
Notes: Field Sheet 07-STR-01, 100' above railroa	ad. ) )		1 1 1 1	
	\ Road	1	<del>                                      </del>	
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sle	oping down to stre	eam 🖘	1111 -	

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				fied Stream N wadeable chan							
Drainat #		Oraioat Name			Cowardin			CAD #	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A Nam	DC ne(s) of Evaluat	2RVA - Area		VA e and Informa	R2	02080104	11/04/2015				
	ering, W. Mo	. ,	Stream Nam	e and inform		TR-08 (	Claiborne	· Pun\			
	Condition: Asse		tion of the stream	and prevailing of			Ciaiborne	: Kull)			
Onamio C				C	onditional Catego		Po		Cou		
	Opti	IIIdi	Subo	ptimal	IVIAI	giriai	1	OI	361	vere	
	The same of the sa	444	Slightly incised, f	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		Deeply incised	(or excavated),	
Channel Condition	Very little incision or 100% stable ban surface protection prominent (80-10 Stable point bars/t are present. Acces floodplain or fully	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ss to their original developed wide	erosion or unproter of banks are s Vegetative protec prominent (60 Depositional feat stability. The bar channels are we	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow Il defined. Stream o bankfull benches,	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strear sediment. Se temporary/tran	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be isient, contribute	widen further. Maji are near vertical. E 60-80% of banl protection presei banks, and is insu erosion. AND/OF stream is covere Sediment is temp	crosion present on ks. Vegetative nt on 20-40% of efficient to prevent 60-80% of the ed by sediment. corary/transient in	vertical/lateral in incision, flow cor banks. Streamb rooting depth, n vertical/underc protection present banks, is not pre	stability. Severe attained within the ad below average najority of banks aut. Vegetative on less than 20% of eventing erosion. bughing present.	
	bankfull benches. I and transverse ba sediment deposition 10% of b	rs few. Transient n covers less than	or newly develope portions of the r sediment cover	d floodplains along reach. Transient is 10-40% of the bottom.	stability, may be AND/OR V-shap vegetative protect banks and deposit	on that contribute to forming/present. ed channels have ion on > 40% of the ional features which to stability.	nature, and contrib AND/OR V-shape vegetative protecti 40% of the bar sediment depos	ed channels have on is present on > nks and stable	Erosion/raw bar AND/OR Aggradin than 80% of stream deposition, contrib Multiple thread	ks on 80-100%. g channel. Greater bed is covered by	CI
Score	3		L	.4		2	1.		,		2.4
IOTES>>	N BUFFERS: A				RR 2	King.			2, 100' dowr		
		loocoo bolli balli	cs 100 foot ripana	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt	th may be accep	otable)		
			Con	ditional Cate	gory		ts of length & widt	th may be accep	notable)		
	Opti		Con		gory	ginal	ts of length & widt		NOTES>> Low subor		
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained		Or Low Poor:	NOTES>> Low subor patches of forest. Hig gas pipelir recently di	young h poor = ne ROW,	
•	Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cateceptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) presentl, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or ofther comparable	NOTES>> Low subor patches of forest. Hig gas pipelir recently di	young h poor = ne ROW,	
Buffers	Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a derstory. Wellands e riparlan areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active fee lots, trails, or of other comparable conditions.	NOTES>> Low subor patches of forest. Hig gas pipelir recently di	young h poor = ne ROW,	
Condition Scores  Delineate rips scriptors. Determine so low.	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a lerstory. Weltands a riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Categorian Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded dust, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100	NOTES>> Low subor patches of forest. Hig gas pipelir recently di	young h poor = ne ROW,	
Condition Scores  Delineate rips scriptors. Determine solow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a lerstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorian Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Low subop patches of forest. Hig gas pipelin recently di	young h poor = le ROW, sturbed.	
Condition Scores  Delineate ripsocriptors. Determine solow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located loc	mal  3 inches) present, nopy cover and a leftstory. Weltands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Categorian Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded dust, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100	NOTES>> Low subor patches of forest. Hig gas pipelir recently di	young h poor = le ROW, sturbed.	CI
Condition Scores  Delineate ripsoriptors. Determine scow. Enter the % I	Tree stratum (dbh > with > 60% tree ca a non-maintained und located within the located wi	mal  3 inches) present, nopy cover and a letrstory. Wetlands a riparian areas.  5  each stream ban ach by measurin Score for each r 60%  0.6	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 40% 1.1	ditional Categorian Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums iparian qual 100 100%	NOTES>> Low subop patches of forest. Hig gas pipelin recently di	young h poor = le ROW, sturbed.	CI 0.68
Condition Scores  Delineate ripiscriptors. Determine scow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	mal  3 inches) present, nopy cover and a leterstory. Wetlands riparian areas.  5  each stream ban ach by measurin  Score for each r  60%  0.6  50%  0.6  arried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le sparian category in 40% 1.1  50% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. (	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided to the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>> Low subop patches of forest. Hig gas pipelir recently di	young h poor = le ROW, sturbed.  cores*0.01)/2 0.80 0.55 Mostly	
Condition Scores  Delineate ripsoriptors. Determine solow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located	mal  3 inches) present, nopy cover and a leferstory. Wetlands riparian areas.  5  ach stream ban ach by measuring Score for each reach of the stream ban of	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 40% 1.1  50% 0.5	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed olots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100  100%	NOTES>> Low subop patches of forest. Hig gas pipelir recently di	young h poor = le ROW, sturbed.  cores*0.01)/2  0.80  0.55  Mostly pted by	
Condition Scores  Delineate rips scriptors. Determine sc low. Enter the % I Right Bank  INSTREAI dercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	mal  3 inches) present, nopy cover and a leterstory. Wetlands riparian areas.  5  beach stream ban ach by measurin 60% 0.6 50% 0.6 aried substrate siffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 40% 1.1  50% 0.5  izes, water velocit exes, stable featu  Subo  Stable habitat ele	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. ( In the blocks below  ty and depths; wo res.  Conditiona ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrul layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks end Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel olts, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Low subop patches of forest. Hig gas pipelir recently di	young h poor = le ROW, sturbed.  cores*0.01)/2  0.80  0.55  Mostly pted by petween. boulder	
Condition Scores  Delineate rips scriptors. Determine sclow. Enter the % I Right Bank  INSTREAL dercut banks; Instream	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located	mal  3 inches) present, nopy cover and a leferstory. Wetlands riparian areas.  5  ach stream ban ach by measuring the stream b	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 40% 1.1  50% 0.5  izes, water velocitexes, stable feature suboptimals with the present in 30-50% are adequate for are suboptimals.	ditional Categoritimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Addition Scores us Calculators are present and the same of the sam	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks etc.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Low subop patches of forest. Hig gas pipelir recently di	young h poor = le ROW, sturbed.  cores'0.01)/2  0.80  0.55  Mostly pted by petween. boulder '. Habitat	

	St	ream In	npact A	ssessm	ent Fo	rm Page	e 2		
Project #	Applicant	Applicant Locality Cowardin Class. HUC Date Data Poin		Data Point	SAR length	Impact Factor			
N/A	CSX VA			R2	02080104	11/04/2015	03-STR-08		
	- ALTERATION: Stream cross poil piles, constrictions, livestock		Conditiona	I Category				NOTES>> Much man channel al	
	Negligible	Mir	nor	Moderate			Severe		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with gal cem	0% of reach is of the channel in the parameter NR 80% of banks bion, riprap, or ent.	Concrete of near railros several bo check-dam & rip-rap b stabilization the stretch	ad bridge, ulder as, gabion ank on most of
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5	1	
SSSILE		ONDITION II							
	REACH C	וו אטרווטאט	ADEV and 2	I KEAW CO	ADITION ON	HO FUR IN	IS KEACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Viewof culvert Top Right: View downstream of culvert Bottom Left: View downstream from culvert Bottom Right: View upstream toward culvert

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 11/04/2015

03-STR-08

Latitude: 38.311433

Evaluator: L. Eggering, W. Moorhead	County: Staffor	d County	Longitude: -77	.447152			
Total Points: 42 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial  e.g. Quad Name:						
A. Geomorphology (Subtotal = 18.5	Absent	Weak	Moderate	Strong			
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)			
2. Sinuosity of channel along thalweg	0	(1)	2	3			
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3			
4. Particle size of stream substrate	0	11	2	(3)			
5. Active/relict floodplain	0	1	2	3			
6. Depositional bars or benches	0	1	(2)	3			
7. Recent alluvial deposits	0	1	2	(3)			
8. Headcuts	0	1	2	3			
9. Grade control	0	0.5	1	1.5			
10. Natural valley	0	0.5	1	1.5			
11. Second or greater order channel	No	0 = 0	Yes:	= 3			
a artificial ditches are not rated; see discussions in manual  B. Hydrology (Subtotal = 10.5)  12. Presence of Baseflow		4	2	(3)			
	0	1	2				
13. Iron oxidizing bacteria	0	1	2	3			
14. Leaf litter	1.5	1	0.5	0			
15. Sediment on plants or debris	0	0.5		1.5			
16. Organic debris lines or piles 17. Soil-based evidence of high water table?	0	0.5 0 = 0	1 Yes:	1.5			
C. Biology (Subtotal = 13)	_ INC	0 = 0	res	= 3)			
18. Fibrous roots in streambed	(3)	2	1	0			
19. Rooted upland plants in streambed	(3)	2	1	0			
20. Macrobenthos (note diversity and abundance)		1	2	3			
21. Aquatic Mollusks	0		2	3			
22. Fish	0	0.5	1	1.5			
23. Crayfish	0	0.5	1	1.5			
24. Amphibians	0	0.5	1	1.5			
25. Algae	0	0.5	1	1.5			
26. Wetland plants in streambed		FACW = 0.75	OBL = 1.5 Other = 0	)			

Sketch:

Notes: Aquatic mollusks ,fish,, crayfish, or amphibians observed, however habitat looked good, so presence is

	Ephe	mera		fied Stream N	Methodology 1			(For	m 1a)		
Project #	Project Name			Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Area 03			VA	R6	02080104	8/11/16		iongai	1	
	e(s) of Evalua		Stream Nam	e and Inform	ation				ļ		
L. Po	staski, R. P	orath				03-S	ΓR-09				
2. RIPARIAN	BUFFERS: A	Assess both bank	's 100 foot riparia	n areas along the	entire SAR. (rou	gh measurements	of length & width	may be acceptab	ole)		
	I			ditional Cate	<del>, ,</del>				NOTES>>This	-	
	Optimal  Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.		Subo	ptimal	Mar	ginal Low Marginal:		oor	stream bed I		
Riparian Buffers			High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	e or		
Condition	1.	F	High 1.2	1.1	High	Low	High	0.5	-		
Scores	1.	.o	1.2	1.1	0.85	0.75	0.6	0.5			
Determine squ below.	rian areas along e uare footage for ea Riparian Area and S	ach by measuring	or estimating len	gth and width. Ca	alculators are prov		of % F	the sums Riparian equal 100			
Right Bank	% Riparian Area>	100%						100%			
	Score >	0.85							CI= (Sum % RA * Sc	ores*0.01)/2	
Left Bank	% Riparian Area>	100%						100%	Rt Bank CI >	0.85	CI
Leit Dalik	Score >	1.1							Lt Bank CI >	1.10	0.98
		REACH C	ONDITION I	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH				
NOTE: The CIs and F	RCI should be rounded	d to 2 decimal places.	The CR should be ro	unded to a whole nui	mber.				CONDITION INDE	, ,	0.49
									ON REQUIREME		0
								CR = RCI	I X LF X IF		
DESCRIBE F	PROPOSED IN	ΛΡΑ <b>C</b> Τ:									
_ LOOKIDE F	OOLD III										

NC DWQ Stream Identification Form Version 4.11

Date: 08/11/2016 Project/Site: DC2RVA - Area 03 Latitude: 38.303888

Evaluator: L. Postaski, R. Porath County: Stafford Longitude: -77.447721

Evaluator: L. Postaski, R. Porath

County: Stafford

Longitude: -77.447721

Total Points: 4.5

Stream Determination (circle one)

Stream is at least intermittent if ≥ 19 or perennial if ≥ 30\*

County: Stafford

County: Stafford

Longitude: -77.447721

Other

e.g. Quad Name:

A. Geomorphology (Subtotal = $2.5$	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence				
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0		1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $0$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles		0.5	1	1.5
17. Soil-based evidence of high water table?		0 = 0	Yes:	
C. Biology (Subtotal = $\frac{2}{2}$ )				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians		0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed			OBL = 1.5 Other = 0	
*perennial streams may also be identified using other metho	ods. See p. 35 of manua	<u> </u>		
Notes: 7-B-STR-2	·			
Sketch:				

		Stre		fied Stream N	iletnodology i	or use in virg	jinia				
			For use in	wadeable chan	nels classified a	s intermittent or	perennial				
Project #	ı	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Area			VA e and Informa	R2	02080104	11/04/2015				
Name(s) of Evaluator(s)  L. Eggering, W. Moorhead			Stream Nam	e and imornia	03-STR-10a (Claiborne Rui			n Pun)			
	Condition: Asse		tion of the stream	and prevailing co			(Claibolli	- IXuII)			
				C	Conditional Catego	ry	Po	or	Sov	voro.	
	Optimal		Optimal Suboptimal		Marginal		Poor		Severe		
Channel Condition	Very little incision on 100% stable ban surface protection prominent (80-1 Stable point bars' are present. Acce floodplain or fully bankfull benches. and transverse basediment depositio 10% of 10% of 10% of 10% of 10% of 100% of 1	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars, irs few. Transient n covers less than	getative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along or entire of the death.		both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40- 60% of stream is covered by sediment. Sediment may be temporary/transient, contribute		widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable		Leeply invisco (vi exchange (vi exchange) incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR. Aorgrafing changel. Greater		
											С
Score	3	3		2.4		2		1.6		1	
	Most o	f stream be	ed covered		nt. Well inc		ank well ve		here not ve		
NOTES>> 2. RIPARIAI	Most o	sl	oping cond	by sedime crete. Field	Sheet: 07-	cides, but b	100' downs	getated w tream of R			
	N BUFFERS: A	SI Assess both bank	oping cond t's 100 foot riparia	by sedime crete. Field an areas along the ditional Categ	Sheet: 07-	cides, but b STR-03	100' downs	getated w tream of R	R.		
	Opti  Tree stratum (dbh > with > 60% tree ca	sl  Assess both bank  mal  3 inches) present, nopy cover and a derestory. Wellands	coping conc  con  Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	by sedime crete. Field an areas along the	Sheet: 07-	cides, but b	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	getated w tream of R h may be accep  Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	table)		
2. RIPARIAI Riparian Buffers Condition	Opti  Tree stratum (dbh > with > 60% tree con-maintained unc	mal  3 inches) present, nopy cover and a refersory. Wetlands e riparian areas.	coping cond c's 100 foot riparia  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	by sedime crete. Field an areas along the ditional Cate ptimal Low Suboptimal:  Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Sheet: 07- e entire SAR. (ro gory  Mar  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	getated w tream of R h may be accep or Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	table)		
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Opti  Tree stratum (dbh > with > 60% tree canon-maintained und located within the located	sissess both bank mal -3 inches) present, noper over and a noper cover and a noper sory. Wetlands a riparian areas.	coping conc  state of the concept of	by sedime crete. Field an areas along the ditional Categorimal  Low Suboptimal:  Riparian areas with tree strain (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. Congth and width. Congth core and congth and congth and congth and width. Congth areas and congth	e entire SAR. (ro gory  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	getated w tream of R h may be accep  Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	table)		
Riparian Buffers  Condition Scores 1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %	Opti  Tree stratum (dbh > with > 60% tree canon-maintained und located within the located	slassess both bank mal  3 inches) present, noches over and a negroover and a n	coping concess and should always a non-maintained understory.  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C	by sedime crete. Field an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree strain (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Coungth and width. Counth blocks below	e entire SAR. (ro gory  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr	getated w tream of R h may be accep  Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	table)	rtical or	
Riparian Buffers  Condition Scores 1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %	Opti  Tree stratum (dbh > with > 60% tree conon-maintained und located within the located	slassess both bank mal  3 inches) present, nopy cover and a refersory. Welfarstory welf and are riparian areas.  5  each stream ban ach by measurin Score for each ri 30% 0.75	coping conc  state of the concept of	by sedime crete. Field an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree strain (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Coungth and width. Counth blocks below	e entire SAR. (ro gory  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr	getated w tream of R h may be accep  Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	CI= (Sum % RA * Si Rt Bank CI >	rtical or	CI CI
Condition Scores  Delineate rip Edescriptors  Delta the % of the second	Opti  Tree stratum (dbh > with > 60% tree conon-maintained und located within the located	ssess both bank mal  3 inches) present, unopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban ach by measurin 30% 0.75 100% 1.5 arried substrate si	coping cond  c's 100 foot riparia  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in 60% 0.5	by sedime crete. Field an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree strain (dbh > 3 riaches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. Congt	sheet: 07-i e entire SAR. (ro gory  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicate Samuel Category  W.  Indicate Samuel Category  Mar	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbn > 3 inches) ainches) avoyer with maintained understory.  Low  0.75  Sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks ed	getated w tream of R h may be accep  Tor  Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed iots, trails, or other comparable conditions.  Low  0.5  The sums parian qual 100 100%  100%	RR.  NOTES>>  Cl= (Sum % RA * Si	cores*0.01)/2 0.53 1.50 ng, much m, no	
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % Right Bank Left Bank 3. INSTREAL undercut banks;	Tree stratum (dbh with > 60% tree canon-maintained und located within the located within	ssess both bank mal  3 inches) present, unopy cover and a ferstory. Wetlands e riparian areas.  5  ach stream ban ach by measurin 30% 0.75  100% 1.5 arried substrate si ffle poole comple mal re typically present	coping cond  It's 100 foot riparia  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in  60%  0.5	by sedime crete. Field an areas along the ditional Categorium Cate	Sheet: 07-i e entire SAR. (ro gory  Mar  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided at Category  Mar  Stable habitat ele present in 10-30 are adequate for are dequate for are designed.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks et	getated w tream of R h may be accep  Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	Cl= (Sum % RA * Si Rt Bank Cl > Lt Bank Cl > NOTES>> Fair shadin sand botto	cores*0.01)/2 0.53 1.50 ng, much m, no no riffles	C

	St	ream In	npact A	ssessm	ent For	m Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2	02080104	11/04/2015	03-STR-10a	3		
4. CHANNEI	L ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks	straightening of ch		ation,	NOTES>>		
	poil piles, constrictions, livestock					,	,	Box culver	t, cement	
	Negligible	Mir	Conditiona nor		erate	Severe		wall intake		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with ga cem	y of the channel in the parameter OR 80% of banks bion, riprap, or	or asphalt slope. Rip- rap all along road side.		CI
SCORE	1.5 1.3		1.1	0.9	0.7	0.5				0.70
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			
NOTE: The CIs and R	RCI should be rounded to 2 decimal places. T	he CR should be roun	nded to a whole number	er.				CONDITION INI		
					İ			I= (Sum of all C		
					ļ			ION REQUIREN	IENI (CR) >>	0
INSERT PHO	700						UK = KU	11 V FL V IL		
DESCRIBE F	PROPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11 Claiborne Run 03-STR-10a

1,02,1,620000000000000000000000000000000		
Date: 11/04/2015	Project/Site: DC2RVA - Area 03	Latitude: 38.303105
Evaluator: L. Eggering, W. Moorhead	County: Stafford County	Longitude: -77.448319
<b>Total Points:</b> 33.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 13	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	(0)	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0		2	3
ripple-pool sequence		$\overline{}$		
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(9)	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	o = 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual	l .			
B. Hydrology (Subtotal = 8.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	_	0 = 0	Yes:	
C. Biology (Subtotal = <u>12</u> )				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	9	1	(2)	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	(1.5)
26. Wetland plants in streambed			OBL = 1.6 Other = 0	
*perennial streams may also be identified using other method	ods. See p. 35 of manua	<u> </u>		
Notes: Macrobenthic invertebrates observed, hyd			heet 07-STR-03.	
110100:			-	
0	S	111		
Sketch:	7 0	TT	5	
Sketch.	hov )		1	
10.1	box jo	-III		
cul	box box	1	1	
16. 1			road	
	T TO	+-	road	
	road	<b>E</b> +	1	
	1 2		1	
	stream	17	1	

					or use in Virg	lethodology f	ified Stream N	Uni			
	Impact	Impact/SAR	SAR#	perennial Date	intermittent or p	nels classified as Cowardin	n wadeable chan		Project Name		Project #
	Factor	length	SAR#			Class.	_				-
				08/11/2016	02080104	R2	VA e and Informa		C2RVA - Area	e(s) of Evaluat	N/A Name
			e Run)	(Claiborn	ΓR-10b					gering, R. P	
				( )			and prevailing cond	on of the stream a	ss the cross-section	ondition: Asse	. Channel C
	ere	Seve	or	Po	y ginal	Conditional Categor	ptimal	Subo	imal	Opti	
	ST. Company	5		15		Often incised, but I	~	1	Channel Condition  Very little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.		
CI	Deeply incised (or excavated), verticalAlateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank son 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.		Overwidened/incised.  Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is		stable than Severe wer bank slopes. seent on 40-60% of ive protection on 40 treambanks may rout. AND/OR 40-vered by sediment. emporary/transient, ty. Deposition that ability, may be ND/OR V-shaped tative protection on s and depositional	Poor. Banks more or Poor due to Ic Erosion may be priboth banks. Vegetal 60% of banks. Severtical or under 60% of stream is cc Sediment may be toontribute instabilitic contribute to siforming/present. A	ew areas of active tede banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow efined. Stream likely nkfull bender along reach. Transient 0-40% of the stream tom.	erosion or unproted of banks are sit Vegetative protect prominent (60- Depositional feat stability. The bar channels are well du has access to ba newly developed portions of the re-			
2.4		1	.6	1.	2	2	.4	2	3	3	Score
		NOTES>>	ay be acceptable)	length & width ma	measurements of	, ,	areas along the en	•	ssess both bank's	BUFFERS: As	. RIPARIAN
				Do	uim a I	Mor	ntimal		imal	Onti	
			or	Po	ginal	Mar	ptimal		imal	Opti	
			Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.		High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).		> 3 inches) present, anopy cover and a derstory. Wetlands	Tree stratum (dbh > with > 60% tree ca	Riparian Buffers
			Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	> 3 inches) present, anopy cover <mark>and a</mark> derstory. Wetlands e riparian areas.	Tree stratum (dbh > with > 60% tree ce non-maintained un located within the	
			Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  egories and Conduth and width. Calc	High Suboptimal: Riparian areas with tree stratum (dbh 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate or estimating lengers	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	Condition Scores  Delineate ripar
			Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  egories and Conduth and width. Calc	High Suboptimal: Riparian areas with tree stratum (dbh 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate or estimating lengers	> 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	Condition Scores  Delineate ripar  Determine squ
	proc*0 041/2		Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  egories and Conduth and width. Calc	High Suboptimal: Riparian areas with tree stratum (dbh 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate or estimating leng	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Tree stratum (dbh > with > 60% tree canon-maintained uncoated within the located within t	Condition Scores  Delineate ripar
CI	ores*0.01)/2 1.03	CI= (Sum % RA * So Rt Bank CI >	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  egories and Conduth and width. Calc	High Suboptimal: Riparian areas with tree stratum (dbh 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate or estimating leng	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	Condition Scores  Delineate ripar Determine squ Enter the % Ri Right Bank
CI 0.81			Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums ciparian qual 100 100%	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  egories and Conduth and width. Calc	High Suboptimal: Riparian areas with tree stratum (dbh 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate or estimating leng	- 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 ach stream bank i ach by measuring coorse for each riparian areas.	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	Condition Scores  Delineate ripar Determine squ Enter the % Ri
	1.03	Rt Bank CI >	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums tiparian qual 100 100%	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water, if present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	High Marginal: Non-maintained, dense herbaceous vegetation with sither a shrub layer or a tree layer (dbh s inches) present, with <30% tree canopy cover.  High 0.85	Low Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with - 3 0% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Cond th and width. Calc the blocks below.	Subo  High Suboptimal: Riparian areas with tree stratum (dbh 30 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate or estimating lenguarian category in the 50%  0.85	5 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 ach stream bank i ach by measuring to 50% 1.2 100% 0.6	Tree stratum (dbh > with > 60% tree conon-maintained unclocated within the located within	Condition Scores  Delineate ripar Determine squ Enter the % Ri Right Bank  Left Bank INSTREAM
	1.03	Rt Bank CI >	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums tiparian qual 100 100%  100%	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water, If present, tree stratum (dbh >3 inches) present, tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  stion Scores using culators are provid	Low Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with - 3 0% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Conduth and width. Calcuth and width. Calcuth and width. Calcuth and width. Calcuth and depths; woody Conditiona	Subo  High Suboptimal: Riparian areas with tree stratum (db- 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate or estimating lenguarian category in the 50%  0.85	s 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 ach stream bank i ach by measuring to 50% 1.2 100% 0.6 ried substrate size complexes, stable	Tree stratum (dbh > with > 60% tree canon-maintained una located within the located withi	Condition Scores  Delineate ripar Determine squ Enter the % Ri Right Bank  Left Bank  INSTREAM anks; root mats;
	1.03	Rt Bank CI >	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums tiparian qual 100 100%  100%  standard trails tiparian qual trails tiparian qual trails tiparian qual libuta and trails tiparian qual libuta libuta and trails tra	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and steed and steed area, recently seeded and steed area, area area, and seeded and steed area area, and seeded and seeded area, and seeded	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water, if present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  stion Scores using culators are provid	Low Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with - 3 0% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Cond th and width. Calc the blocks below.	High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Into Condition Cate or estimating lenguation are stimating lenguation are stimating lenguation and strategy in the state of the strategy in the state of the strategy in the state of the strategy in the state of the strategy in the state of the strategy in the state of the strategy in the state of the strategy in the state of the strategy in the strategy i	s 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5.5  ach stream bank i ach by measuring to some for each riparian areas.  1.00%  1.00%  0.6  ried substrate size complexes, stable imal	Tree stratum (dbh > with > 60% tree conon-maintained unclocated within the located within	Condition Scores  Delineate ripar Determine squ Enter the % Ri Right Bank  Left Bank INSTREAM

	Si	tream In	npact A	ssessm	ent For	m Page	2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	•
N/A	CSX		VA	R2	02080104	08/11/2016	03-STR-10b	500	1	
4. CHANNEL spoil piles, constr	. ALTERATION: Stream crossin ictions, livestock	igs, riprap, concre			ghtening of chanr	nel, channelization	n, embankments,	NOTES>>Stratong Naom	i Road	
	Negligible	Mir		al Category Mod	erate	Se	vere	between the highway und	railroad and	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% by any of the char in the parameter 80% of banks sl	of reach is disrupted inel alterations listed guidelines AND/OR nored with gabion, or cement.	ingiway uni	dei passes.	
SCORE	1.5	1.3	1.1	0.9	0.7	C	).5			0.70
	REACH (	CONDITION	NDEX and S	TREAM CON	IDITION UNI	TS FOR THI	S REACH			
NOTE: The Cls and R	CI should be rounded to 2 decimal places. Th							CONDITION IN	IDEX (RCI) >>	1.02
								= (Sum of all C		
									MENT (CR) >>	0
							CR = RCI	X LF X IF		,
DESCRIBE P	ROPOSED IMPACT:									

## NC DWQ Stream Identification Form Version 4.11 Claiborne Run 03-STR-10b

Date: 08/11/2016	Project/Site: DC2RVA - Area 03	Latitude: 38.302865
Evaluator: L. Postaski, R. Porath	County: Stafford	Longitude: -77.447452
Total Points: 34 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 14.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0		2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
3. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual	·			
B. Hydrology (Subtotal = 10.5)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 9.0 )				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1. Other = 0	
*perennial streams may also be identified using other method	ds. See p. 35 of manua	l.		
Notes: This is Claiborne Run. 7-B-STR-01				
Sketch:				

		Stre					(For	m 1)			
						or use in Virg					
Project #	Р	roject Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area		VA	R1	02080104	11/04/2015				
	ne(s) of Evaluate	. ,	Stream Nam	e and Informa							
L. Egg	ering, W. Mod	orhead			03-STR	-11 (Ra	ppahanno	ck River	·)		
Channel C	Condition: Asses	s the cross-sec	ction of the stream		ondition (erosion,						
	Optin	nal	Subo	ptimal		ginal	Po	or	Sev	vere	
	The same of the sa			سار م		less than Severe or stable than Severe	Overwidene Vertically/laterally		1	5	
Channel Condition	Very little incision or a 100% stable banh surface protection prominent (80-10t Stable point bars/bi are present. Access floodplain or fully o bankfull benches. M and transverse bar	ks. Vegetative or natural rock, 0%). AND/OR ankfull benches s to their original developed wide flid-channel bars,	erosion or unproted of banks are stogetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to or newly develope	ew areas of active cted banks. Majority table (60-80%). ition or natural rock-80%) AND/OR ures contribute to akfull and low flow II defined. Stream to bankfull benches, d floodplains along	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by discovered by discovered by discovered by discovered to that contribute on that contribute to the significant of th	widen further. Major are near vertical. E 60-80% of bank protection preset banks, and is insurerosion. AND/OF stream is covere Sediment is temp nature, and contrib	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the bed by sediment, orary/transient in outing to instability.	incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre	stability. Severe trained within the ed below average najority of banks tut. Vegetative on less than 20% of eventing erosion. pughing present.	
	sediment deposition 10% of bo	covers less than	sediment cover	each. Transient s 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have ion on > 40% of the ional features which to stability.	AND/OR V-shape vegetative protection 40% of the barn sediment depos	on is present on > iks and stable		channels and/or	CI
Score	3		2	.4	:	2	1.	6	1		2.4
NOTES>>	Erosion pi	robably ei	nhanced by	obstruction	on of bridge of RR		ield Sheet:	07-STR-04	100° do	wnstream	
RIPARIAI	N BUFFERS: As	ssess both bank				ugh measuremen	ts of length & widt	h may be accep	table)		
	Ontin	nal		ditional Categorical		ginal	Po	or	NOTES>>		
Riparian Buffers	Optimal  Optimal  Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.		High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and amaintained understory. Wetlands		High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover. with <30% tree canopy cover with maintained.  Hon-maintained.  dense herbaceous vegetation, rigarian areas lacking shrub and tree stratum, hab open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained		actively grazed pasture, sparsely vegetated non-		High margi dense rive hearb/vine, with some trees + a b similar veg 60' upslope	rbank /shrub large and of letation ~	
			understory.	vegetation).		with <30% tree canopy cover with maintained	other comparable	other comparable	poor = mov	wed lawn	
			understory.  High	Low	High	with <30% tree canopy cover with	other comparable	other comparable	poor = mov	wed lawn	
	1.5	<u> </u>	-		High 0.85	with <30% tree canopy cover with maintained understory.	other comparable condition.	other comparable conditions.	poor = mov	wed lawn	
escriptors.  Determine solutions  elow.  Enter the %	parian areas along ea quare footage for ea Riparian Area and S	ach stream ban	High 1.2 k into Condition C	Low 1.1 ategories and Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width.	0.85  Ondition Scores us  Calculators are pr	with <30% tree canopy cover with maintained understory.  Low  0.75	other comparable condition.	Low 0.5  ne sums	poor = mov	wed lawn	
Delineate ripscriptors. Determine solow. Enter the %	parian areas along ea quare footage for ea Riparian Area and S	ach stream ban ach by measurin Score for each ri	High 1.2 k into Condition C g or estimating le	Low 1.1 ategories and Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width.	0.85  Ondition Scores us  Calculators are pr	with <30% tree canopy cover with maintained understory.  Low  0.75	other comparable condition.  High  0.6  Ensure the of % R	Low 0.5  ne sums iparian qual 100	poor = mov like habitat	wed lawn	
Delineate ripscriptors. Determine sclow. Enter the %	parian areas along ea quare footage for ea Riparian Area and S % Riparian Area> Score >	ach stream ban ch by measurin Score for each ri 20% 0.85	High 1.2 k into Condition C g or estimating le	Low 1.1 ategories and Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width.	0.85  Ondition Scores us  Calculators are pr	with <30% tree canopy cover with maintained understory.  Low  0.75	other comparable condition.  High  0.6  Ensure the of % R	Low 0.5  ne sums iparian qual 100	poor = mov like habitat Cl= (Sum % RA * S Rt Bank Cl >	wed lawn t.  cores*0.01)/2  0.65	CI
Delineate rip scriptors. Determine so low. Enter the %	parian areas along ea quare footage for ea Riparian Area and S % Riparian Area> Score >	ach stream ban sch by measurin 20% 0.85	High 1.2 k into Condition C g or estimating le iparian category in 80% 0.6	Low 1.1 ategories and Congth and width. (and the blocks below	0.85 Indition Scores us Calculators are prov.	with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	other comparable condition.  High  0.6  Ensure the of % R  Blocks et	Low 0.5 ne sums iparian qual 100 100%	poor = mov like habitat Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	wed lawn t.	CI 1.08
Delineate ripscriptors. Determine sclow. Enter the % I Right Bank  Left Bank  INSTREAL	parian areas along ea quare footage for ea Riparian Area and S % Riparian Area> Score >	ach stream ban sch by measurin 20% 0.85 100% 1.5	High 1.2 k into Condition C g or estimating le iparian category it 80% 0.6	Low 1.1  ategories and Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and depths; wo yes.	0.85  Indition Scores us Calculators are prov.	with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	other comparable condition.  High  0.6  Ensure the of % R  Blocks et	Low 0.5 ne sums iparian qual 100 100%	poor = mov like habitat Cl= (Sum % RA * S Rt Bank Cl >	cores*0.01)/2 0.65 1.50	
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Delineate ripscriptors. Determine solow. Enter the % I Right Bank  INSTREAL dercut banks; Instream Habitat/	warian areas along ea quare footage for ea Riparian Area and S % Riparian Area> Score > % Riparian Area> Score > M HABITAT: Var ; root mats; SAV; riff	ach stream ban cch by measurin 20% 0.85 100% 1.5 ried substrate si fle poole comple nal etypically present % of the reach.	High 1.2 k into Condition C g or estimating le iparian category in 80% 0.6  Zes, water velocit exes, stable featu Subo Stable habitat ele present in 30-509 are adequate fo popul	Low 1.1 sategories and Congth and width. (In the blocks below by and depths; wores. Conditional primal brimal brimal brims are typically	0.85  Indition Scores us  Calculators are prov.  Ody and leafy det  Il Category  Mary  Stable habitat elepresent in 10-309  are adequate for popul	with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substructions; stable substructions are typically ments are typically	other comparable condition.  High  0.6  Ensure the of % R Blocks et  ate; low embeded	Low 0.5  Le sums iparian qual 100 100%  100%  or listed above are stable. Habitat ally present in less the reach.	poor = mov like habitat Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>> Assume op stream of t and gradie	cores*0.01)/2 0.65 1.50 otimal for his order nt, except of bridge	

St	ream In	npact A	ssessm	ent Fo	rm Page	e 2		
Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
CSX		VA	R1	02080104	11/04/2015	03-STR-11		
L ALTERATION: Stream cross poil piles, constrictions, livestock	sings, riprap, conc			straightening of cl	hannel, channeliz	ation,	NOTES>>	
Negligible	Mir	nor	Mod	erate	Sev	ere		
Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	the channel	is disrupted by any of the channel alterations listed in	is disrupted by any of the channel	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with ga	of the channel in the parameter PR 80% of banks bion, riprap, or		
1.5	1.3	1.1	0.9	0.7	0.	5	1	
	Applicant  CSX  - ALTERATION: Stream cross poil piles, constrictions, livestock  Negligible  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	CSX  - ALTERATION: Stream crossings, riprap, concopoil piles, constrictions, livestock  Negligible  Min  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	CSX  VA  - ALTERATION: Stream crossings, riprap, concrete, gabions, or poil piles, constrictions, livestock  Conditiona  Negligible  Minor  Less than 20% of the stream reach is disrupted by any of of the channel alterations listed in the parameter guidelines.  Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	Applicant  CSX  VA  R1  - ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, spoil piles, constrictions, livestock  Conditional Category  Negligible  Minor  Mod  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelized by and of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander guidelines.	Applicant  CSX  VA  R1  02080104  - ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of copoil piles, constrictions, livestock  Conditional Category  Negligible  Minor  Moderate  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander guidelines. If stream has not recovered.  Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander guidelines. If stream has not recovered.	CSX  VA  R1  02080104  11/04/2015  - ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelize poil piles, constrictions, livestock  Conditional Category  Negligible  Minor  Moderate  Sev  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern or has naturalized.  Less than 20% of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	CSX  VA  R1  02080104  11/04/2015  03-STR-11  ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, poil piles, constrictions, livestock  Conditional Category  Negligible  Minor  Moderate  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelized by any of the channel alterations listed in the parameter guidelines.  Severe  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.  Severe  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.  Severe  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.  Severe  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.  Severe  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.  Severe  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.  Severe  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.  Severe  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.  Severe  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.  Severe  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.  Severe  40 - 60% of reach is disrupted by any of the channel alterations listed in the	Applicant  CSX  VA  R1  02080104  11/04/2015  03-STR-11  -ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, poil piles, constrictions, livestock  Conditional Category  Negligible  Minor  Moderate  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, is disrupted by any of the channel alterations listed in the parameter guidelines. If the parameter guidelines. If the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  R10  Data Point  SAR length  NOTES>>  NOTES>>

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: View downstream from south of train bridge Top Right: View of Rappahannock floodplain Bottom Left: View upstream toward train bridge Bottom Right: View downstream toward train bridge

NC DWQ Stream Identification Form Version 4.11 Rappahannock River 03-STR-11

110 2 11 & Stream Lachtenication I of the 1 of Str		
Date: 11/04/2015	Project/Site: DC2RVA - Area 03	Latitude: 38.299605
Evaluator: L. Eggering, W. Moorhead	County: Stafford Co/Fredericksburg	Longitude: -77.453130
<b>Total Points:</b> 48.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 18	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	(0)	1	2	3
ripple-pool sequence			2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	(3)
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	N	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 12.5				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	= 3
C. Biology (Subtotal = 18				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	7	1	2	(3)
21. Aquatic Mollusks	0	1	2	(3)
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed			OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other method	s. See p. 35 of manua			
Notes: Aquatic mollusks and crayfish assumed, no	· · · · · · · · · · · · · · · · · · ·		04 Rappahannock I	River.
Troison i Iquatio monatio and oraynon accumou, no				
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<>~ ←	P T	-6-		
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river's edge	+ +			
· · ·			all of arch	
		W	all of arch —	

	Stream Assessment Form (Form 1)  Unified Stream Methodology for use in Virginia  For use in wadeable channels classified as intermittent or perennial										
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	03	VA	R2SB3	02080104	11/05/2015		length	1 dolor	
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
L. Egg	ering, W. Mo	orhead			03-	STR-12	(Hazel F	Run)			
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opti	imal	Subo	ptimal	conditional Catego Mar	<sub>ry</sub> ginal	Po	or	Sev	ere	
	Very little incision or active erosion; 80- 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient		1		Often incised, but	less than Severe or	Overwiden	ed/incised.	5		
Channel Condition			erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	tion or natural rock -80%) AND/OR tures contribute to akfull and low flow Il defined. Stream to bankfull benches, d floodplains along	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe wer bank slopes: esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to templo/expect.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/Of stream is covere Sediment is temp nature, and contrik	widen further. Majority of both banks		(or excavated), stability. Severe takined within the bid below average najority of banks sut. Vegetative on less than 20% of eventing erosion. boughing present. Iks on 80-100%.	
			sediment cover	reach. Transient is 10-40% of the bottom.	stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.		AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable		AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.		С
Score		3		.4		2	1.		et 07STR/0		2.2
NOTES>> 2. RIPARIAI		-	•		Ru	in.	·				
				00 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  NOTES>>							
	Optimal  Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.						l		NOTES>>		
Riparian Buffers	Tree stratum (dbh : with > 60% tree conon-maintained und	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).		ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a href="4">30%</a> tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.		NOTES>>	·	
Buffers	Tree stratum (dbh : with > 60% tree conon-maintained und	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with layer or a tree layer (dbh > 3 inches) present, with <30% tree	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a href="https://doi.org/10.100/bit/30/">doi.org/10.100/bit/30/"&gt;doi.org/10.100/bit/30/</a>	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>>	·	
	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th	> 3 inches) present, anopy cover and a derstory. Wetlands	Suboj  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Mar High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>	·	
Condition Scores  1. Delineate ripidescriptors. 2. Determine sobelow.	Tree stratum (dbh swith > 60% tree or non-maintained un located within the located within	> 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5.5 each stream ban each by measurin	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums stiparian qual 100	NOTES>>	·		
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Condition Scores  1. Delineate rip: descriptors. 2. Determine scoelow. 3. Enter the % I	Tree stratum (dbh swith > 60% tree or non-maintained un located within the located within	> 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5.5 each stream ban each by measurin	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums stiparian qual 100	NOTES>>  Cl= (Sum % RA * S	cores*0.01)/2		
Condition Scores  1. Delineate rip: descriptors. 2. Determine scoelow. 3. Enter the % I	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th  1. arian areas along i uare footage for e Riparian Area and % Riparian Area> \$ Core >	> 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  100%  1.5	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums stiparian qual 100	C⊫ (Sum % RA * S Rt Bank CI >	1.50	c	
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI	Tree stratum (dbh : with > 60% free cc non-maintained und located within th  1. arian areas along a quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >	> 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each stream ban bach by measurin 100% 1.5  40% 0.75  aried substrate si	Subor  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  60% 1.5  Zes, water velocit	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Coungth and width. (In the blocks below  y and depths; wo	Mar  High Marginal: Non-maintained, dense harbeeous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) from the canopy cover.  High  0.85  Indicate the canopy cover are canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5	CI≕ (Sum % RA * S		CI 1.3
Condition Scores  1. Delineate ripidescriptors. 2. Determine Scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI	Tree stratum (dbh : with > 60% tree ca non-maintained un located within the located withi	> 3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  -5  -5  -6  -6  -6  -6  -7  -7  -7  -7  -7  -7	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating leparian category in 60%  1.5  zes, water velocitiexes, stable features.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Sategories and Co ngth and width. ( In the blocks below  y and depths; wores.  Conditiona	High Marginal: Non-maintained, Vene a high layer or a tree layer or a tree layer or a tree layer or a tree layer or a tree canopy cover.  High  0.85  Indition Scores us Calculators are proven.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	C⊫ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	1.50	
Condition Scores  1. Delineate ripi descriptors. 2. Determine sc below. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh : with > 60% free cc non-maintained und located within th  1. arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  W HABITAT: Va root mats; SAV; r	> 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each stream ban bach by measurin 100% 1.5  40% 0.75  aried substrate si iffle poole completimal	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  60% 1.5  Zes, water velocit exes, stable featur  Subol Stable habitat elei	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Co ngth and width. ( In the blocks below  by and depths; wo res.  Conditiona ptimal ments are typically	High Marginal: Non-maintained, use dependent of the layer of a tree layer of the la	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks ended the seeded and stabilized of the seeded and stabilized or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums cliparian qual 100 100%  100%	C⊫ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	1.50	
Condition Scores  1. Delineate ripidescriptors. 2. Determine schelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	Tree stratum (dbh : with > 60% free cc non-maintained und located within th  1. arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  W HABITAT: Va root mats; SAV; r	> 3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  -5  -5  -6  -6  -6  -6  -7  -7  -7  -7  -7  -7	Suboy  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both chataceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  60% 1.5  zes, water velocit exes, stable featur  Suboy  Stable habitat ele present in 30-50% are adequate fo	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Co ngth and width. ( in the blocks below by and depths; wo res.  Conditiona ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicate of the canopy cover.  Aligh Category  War  Stable habitat ele present in 10-30% are adequate for are shrub layer or a tree layer (dbh > 3 inches) for a shrub layer or a tree layer (dbh > 3 inches) for a shrub layer (dbh > 3	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	CI⇒ (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>>	1.50	

	St	ream In	npact A	ssessm	ent Fo	m Page	e 2			
Project#	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2SB3	02080104	11/05/2015	03-STR-12			
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock  Conditional Category										
	Negligible	l Mii	Conditiona		erate	Sev	oro	storm/sew	er pipe	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	of the channel			Some minor rip-rap.		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5			•
	REACH C	ONDITION II	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH			
IOTE: The CIs and R	CI should be rounded to 2 decimal places.	The CR should be roun	ided to a whole number	er.			THE REACH	CONDITION INI	DEX (RCI) >>	
							RC	I= (Sum of all C	l's)/5	
						(	COMPENSAT	ION REQUIREN	MENT (CR) >>	

CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: View upstream toward culvert under railroad Top Right: View downstream from railroad Bottom Left: View of culvert and stream from side Bottom Right: View of culvert and stream from side

**Hazel Run** 

03-STR-12 NC DWO Stream Identification Form Version 4.11 Project/Site: DC2RVA - Area 03 Latitude: 38,291524 Date: 11/05/2015 Evaluator: L. Eggering, W. Moorhead County: Fredericksburg City Longitude: -77.460813 Total Points: 44.5 Stream Determination (circle one) Other Stream is at least intermittent Ephemeral Intermitten Perennial e.g. Quad Name: if ≥ 19 or perennial if ≥ 30\* **Absent** Weak Moderate Strong A. Geomorphology (Subtotal =  $\underline{22}$ 1<sup>a.</sup> Continuity of channel bed and bank 3 0 2 2. Sinuosity of channel along thalweg 0 1 2 3 3. In-channel structure: ex. riffle-pool, step-pool, 0 1 2 3 ripple-pool sequence 4. Particle size of stream substrate 2 0 1 5. Active/relict floodplain 0 2 1 6. Depositional bars or benches 0 1 7. Recent alluvial deposits 0 2 1 8. Headcuts 0 2 1 9. Grade control 0.5 1 10. Natural valley 0 0.5 11. Second or greater order channel No = 0Yes = 3artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 1112. Presence of Baseflow 2 0 1 13. Iron oxidizing bacteria 0 2 3 14. Leaf litter 1.5 1 0.5 0 15. Sediment on plants or debris 0 0.5 1 16. Organic debris lines or piles 0 0.5 1 17. Soil-based evidence of high water table? No = 0Yes = 3C. Biology (Subtotal = 11.5 18. Fibrous roots in streambed 2 19. Rooted upland plants in streambed 2 0 3 1 20. Macrobenthos (note diversity and abundance) 1 2 3 1 21. Aquatic Mollusks 0 2 3 22. Fish 0 1.5 0.5 1 23. Crayfish 0 0.5 1.5 24. Amphibians 1.5 0 0.5 1 25. Algae 0.5 1.5 Other = 0 26. Wetland plants in streambed FACW = 0.75; OBL = 1.6 \*perennial streams may also be identified using other methods. See p. 35 of manual. Notes: Aquatic mollusks assumed, not observed. Macroinvertabretes only hydropsychic seen. Field Sheet 07 STR05 Hazel Run. concrete storm/sewer drain manhole Sketch:

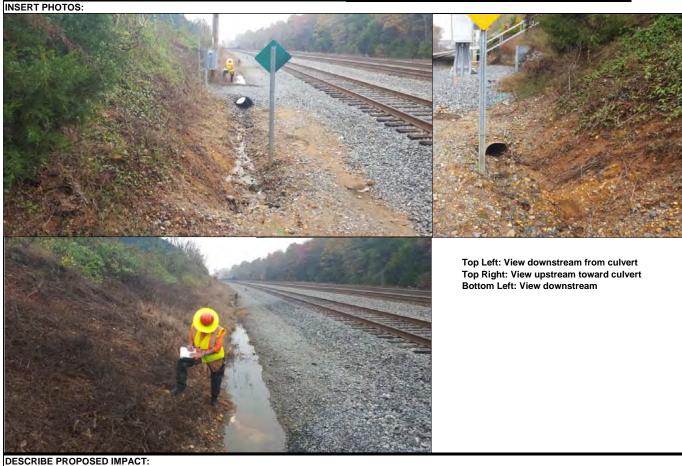
		Stre		SSESS fied Stream N			) (For	m 1)			
				wadeable chan	nels classified a				Impact/SAR	Impact	
Project #		Project Name	•	Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R4SB	02080104	11/05/2015				
	e(s) of Evaluat ering, W. Mo	. ,	Stream Nam	e and Informa	ation	02 67	ΓR-13				
			f f d	1			IK-13				
Channel	Condition: Asse			C	Conditional Catego	ry					
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	market and the second	- NAKE	Slightly incised fa	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		Deeply incised	(or even start)	
Channel Condition	Very little incision or 100% stable ban surface protection prominent (80-10 Stable point bars% are present. Acces floodplain or fully bankfull benches. I and transverse ba	nks. Vegetative n or natural rock, 20%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock- -80%) AND/OR urres contribute to hkfull and low flow Il defined. Stream o bankfull benches, d floodplains along reach. Transient	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Sei temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be isient, contribute on that contribute to forming/present.	widen further. Maja are near vertical. E 60-80% of banl protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the bed by sediment. orary/transient in outing to instability.	vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sk. Erosion/raw ban	stability. Severe tained within the do below average hajority of banks ut. Vegetative on less than 20% of eventing erosion. Dughing present. ks on 80-100%.	
	sediment deposition 10% of b		sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the band	on is present on > iks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	CI
Score	3	}	2	.4		2	1.	6	1		2.0
NOTES>>					Field Shee	t: 07STR06	i.				
. RIPARIAI	N BUFFERS: A	ssess both bank	d's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt	h may be accep	table)		
				ditional Cate	gory				NOTES>>		
	Opti	mal		ditional Cate ptimal I		ginal	Po	or	NOTES>>	·	
Riparian Buffers	Optii  Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	· 3 inches) present, nopy cover and a lerstory. Wetlands	Suboj  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Mar  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>	·	
Buffers	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	. 3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Mar  High Marginal: Non-maintained, dense heriaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stablitzed, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.	NOTES>>		
Buffers	Tree stratum (dbh > with > 60% tree ca	. 3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.	Suboj  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Mar  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>		
Condition Scores  Delineate rip: escriptors. Determine scolow.	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	3 inches) present, nopy cover and a letestory. Wetlands riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both oherbacepos and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  andition Scores us Calculators are pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree stratum (dbh >3 inches) present, alow the canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stablitzed, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>>		
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Condition Scores  Delineate ripsecriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	3 inches) present, nopy cover and a lerstory. Wetlands e riparian areas.  5 each stream ban ach by measurin Score for each rice and a score for each	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  andition Scores us Calculators are pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree stratum (dbh >3 inches) present, alow the canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>  Cl= (Sum % RA * S	cores*0.01)/2	
Condition Scores  Delineate rip- secriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	3 inches) present, nopy cover and a leerstory. Wetlands riparian areas.  5  each stream ban ach by measurin Score for each ri 90% 0.5	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  andition Scores us Calculators are pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree stratum (dbh >3 inches) present, alow the canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	CI= (Sum % RA * S Rt Bank CI >	0.54	CI
Condition Scores  Delineate ripsecriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	5 seach stream ban ach by measurin 90% 0.5	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both chortaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Lategories and Co	Mar  High Marginal: Non-maintained, den-maintained, wegetation with either a shrub layer or a tree layer (dbh > s inches) dree canopy cover.  High  0.85  Indiction Scores us Calculators are pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, so production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies and seeding and stabilized and st	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	C⊫ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >		CI 0.52
Condition Scores  Delineate rips socriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.  5  each stream ban ach by measurin 90% 0.5  100% 0.5	Subor  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. (and the blocks below  y and depths; wo	Mar  High Marginal: Non-maintained, den-maintained, wegetation with either a shrub layer or a tree layer (dbh > s inches) dree canopy cover.  High  0.85  Indiction Scores us Calculators are pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, so production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies and seeding and stabilized and st	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	CI= (Sum % RA * S Rt Bank CI >	0.54	
Condition Scores  Delineate rip- escriptors. Determine scielow. Enter the % I Right Bank  Left Bank  INSTREAL	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.  5  5  ach stream ban ach by measurin 90% 0.5  100% 0.5	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in 10%  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Sategories and Co ngth and width. ( In the blocks below  y and depths; wores.  Conditiona	Mar  High Marginal: Non-maintained, vegetation with either a shrub layer or a tree layer or a tree layer or a tree layer or a tree canopy cover.  High  0.85  Accident Scores us Calculators are province.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 10.5  L	C⊫ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	0.54	
Condition Scores  Delineate rippescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	5  sach stream ban ach by measurin 90% 0.5  100% 0.5  aried substrate siffle poole comple	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbacleuse and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.85  Zes, water velocit exes, stable featur  Subol Stable habitat elei	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Co ngth and width. ( In the blocks below  by and depths; wo res.  Conditiona ptimal ments are typically	High Marginal: Non-maintained, sequetation with either a shrub layer or shrub lay	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, alow the wind and an an an an an an an an an an an an an	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ed  Blocks ed  Aller in the comparable condition in the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%	C⊫ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	0.54	
Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.  5  ach stream ban ach by measurin 90% 0.5  100% 0.5  aried substrate si ffle poole comple mal	Suboy  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both ontaining both onta	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Co ngth and width. ( in the blocks below by and depths; wo res.  Conditiona ptimal	High Marginal: Non-maintained, dense hair Category  High Marginal: Non-maintained we getation with either a shrub layer or a tree layer (dbh > sainches) for the canopy cover.  High 0.85  Indicate of the canopy cover.  All Category Mar Stable habitat ele present in 10-30 are adequate for an endors we have considered to the canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed	Low Poor: Impervious surfaces, mine spol lands, denuded surfaces, row crops, active feed iols, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%  100%  Ilisted above are stable. Habitat lily present in less	C⊫ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	0.54	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor R4SB 02080104 11/05/2015 03-STR-13 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is the parameter guidelines. If stream has been disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. is disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has been shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. CI 1.5 0.5 SCORE 1.3 1.1 0.9 0.7 0.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0



Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 11/05/2015

03-STR-13

Evaluator: L. Eggering, W. Moorhead	County: Freder	icksburg City	Longitude: -77	.461346
<b>Total Points:</b> 22.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 4.5	Absent	Weak	Moderate	Strong
1 <sup>a</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	O	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
5. Depositional bars or benches	(a)	1	2	3
. Recent alluvial deposits	(0)	1	2	3
. Headcuts		1	2	3
. Grade control	0	0.5	1	1.5
0. Natural valley		0.5	1	1.5
Second or greater order channel	No	0 = 0	Yes :	= 3
artificial ditches are not rated; see discussions in manual				
3. Hydrology (Subtotal = 9)				
2. Presence of Baseflow	0	1	2	(3)
3. Iron oxidizing bacteria	0	1	2	3
4. Leaf litter	1.5	1	0.5	0
5. Sediment on plants or debris	0	0.5	1	1.5
6. Organic debris lines or piles	0	0.5	1	1.5
7. Soil-based evidence of high water table?	No	0 = 0	Yes :	= 3
C. Biology (Subtotal = 9)				
8. Fibrous roots in streambed	(3)	2	1	0
Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)		1	2	3
1. Aquatic Mollusks	<b>O</b>	1	2	3
2. Fish		0.5	1	1.5
3. Crayfish	0	0.5	1	1.5
4. Amphibians		0.5	1	1.5
5. Algae	0	0.5	1	1.5
6. Wetland plants in streambed		FACW = 0.75 OB	L = 1.5 Other = 0	)
*perennial streams may also be identified using other metho	=-			
lotes: Aquatic mollusks, fish, crayfish, and ampl	hibians are assume	ed. Narrow railroad	ditch. Field Shee	et: 0/STR06.
street		fo	nce	
Sketch: ste	ep sandy slop	e le	1100	
m d to to	<i>A</i>	_		
mi- n- (7 -1)	(J)			
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and the second		- Landendard Land		
		1111	1	

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
		N			nels classified a			212 "	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R4SB	02080104	11/05/2015				
	e(s) of Evaluate ering, W. Mod	. ,	Stream Nam	e and Informa	ation	U3-6.	ΓR-14				
	Condition: Asses		tion of the atroom	and provoiling o	andition (arasian		1117-114				
Channel				C	Conditional Catego	ry					
	Optin	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	1	MAN AND AND AND AND AND AND AND AND AND A	Slightly incised for	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		Deeply incised	(or even unted)	
Channel Condition	Very little incision or 100% stable bank surface protection prominent (80-10) Stable point bars/b: are present. Acces floodplain or fully chankfull benches. Mand transverse ban	ks. Vegetative or natural rock, 10%). AND/OR ankfull benches as to their original developed wide Mid-channel bars,	erosion or unproted of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Sei temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Major are near vertical. E 60-80% of bank protection preset banks, and is insurerosion. AND/OF stream is covere Sediment is temp nature, and contrib	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in- incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank slo Erosion/raw ban	stability. Severe tained within the delow average aportity of banks ut. Vegetative on less than 20% of venting erosion. Bughing present.	
	sediment deposition 10% of bi	covers less than	sediment cover	reach. Transient is 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have ion on > 40% of the ional features which to stability.	AND/OR V-shape vegetative protection 40% of the barn sediment depos	on is present on > aks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	g channel. Greater bed is covered by uting to instability. channels and/or	CI
Score	3		L	.4	I	2	1.		1		1.6
NOTES>>	Channel a	appears to	be periodi	cally dug o		osed to ero of culvert.	ded by flov	v). Field SI	heet 07STR	07 100'	
RIPARIAI	N BUFFERS: As		Con	an areas along the ditional Cateo	gory	ugh measuremen		h may be accep	NOTES>>		
	Орин	IIai	Oubo	pumai	IVICII		Po.	or			
Riparian Buffers	Tree stratum (dbh > with > 60% tree can non-maintained unde located within the	nopy cover and a erstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a href="https://doi.org/10/4">ainches) present, with </a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a>					

	St	ream In	npact A	ssessm	ent Fo	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	csx		VA	R4SB	02080104	11/05/2015	03-STR-14		
	L ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, conc		concrete blocks,	straightening of cl	hannel, channeliz	ation,	NOTES>> Dug ditch	
	Negligible	Mi	nor		erate	Sev	ere	appears to	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		of the channel in the parameter PR 80% of banks bion, riprap, or	periodicall reexcavate	•
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5		
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: Typical view of stream and stormdrain Top Middle: Stream across access road

Top Right: Typical view of stream Bottom Left: Typical view of stream Bottom Right: Typical view of stream

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Date: 11/05/2015

03-STR-14

Latitude: 38.283027

Evaluator: L. Eggering, W. Moorhead	County: Frederic	cksburg City	Longitude: -77.460725		
Total Points: 20.75	Stream Determin	nation (circle one)	Other		
Stream is at least intermittent	Ephemeral Inter	rmittent Perennial	e.g. Quad Name:		
if ≥ 19 or perennial if ≥ 30*			o.g. quad riamo	'	
A. Geomorphology (Subtotal = 7)	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)	
2. Sinuosity of channel along thalweg	0	(1)	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	(1)	2	3	
7. Recent alluvial deposits	0	(1)	2	3	
8. Headcuts	0	Ŷ	2	3	
9. Grade control	0	0.5	1	1.5	
			4	1.5	
10. Natural valley		0.5	1	1.5	
11. Second or greater order channel		0.5	1 Yes		
11. Second or greater order channel  artificial ditches are not rated; see discussions in manual					
11. Second or greater order channel					
11. Second or greater order channel  artificial ditches are not rated; see discussions in manual					
11. Second or greater order channel  a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 8	No	= 0	Yes	= 3	
11. Second or greater order channel  artificial ditches are not rated; see discussions in manual  B. Hydrology (Subtotal = 8 )  12. Presence of Baseflow	0	1	Yes 2	= 3	
11. Second or greater order channel  artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 8 )  12. Presence of Baseflow  13. Iron oxidizing bacteria	0 0	1	2 2	3 3	
11. Second or greater order channel  artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 8 )  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles	0 0 0 1.5	1 1	2 2 0.5	3 3 0	
11. Second or greater order channel  artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 8 )  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles	0 0 1.5 0	1 1 1 0.5	2 2 0.5	3 3 0 1.5 1.5	
11. Second or greater order channel  artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 8 )  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?	0 0 1.5 0	1 1 0.5 0.5	2 2 0.5	3 3 0 1.5 1.5	
11. Second or greater order channel  artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 8 )  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?  C. Biology (Subtotal = 5.75 )	0 0 1.5 0	1 1 0.5 0.5	2 2 0.5	3 3 0 1.5 1.5	
11. Second or greater order channel  artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 8 )  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?  C. Biology (Subtotal = 5.75 )  18. Fibrous roots in streambed	0 0 0 1.5 0 0 No	1 1 0.5 0.5	2 2 0.5 1 1 Yes	3 3 0 1.5 1.5	
11. Second or greater order channel  artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 8 )  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?  C. Biology (Subtotal = 5.75 )  18. Fibrous roots in streambed  19. Rooted upland plants in streambed	0 0 1.5 0 0 No	1 1 0.5 0.5 0.5 = 0	2 2 0.5 1 1 Yes	3 3 0 1.5 1.5	
11. Second or greater order channel  artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 8 )  12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 15. Sediment on plants or debris 16. Organic debris lines or piles 17. Soil-based evidence of high water table?  C. Biology (Subtotal = 5.75 ) 18. Fibrous roots in streambed 19. Rooted upland plants in streambed 20. Macrobenthos (note diversity and abundance)	0 0 1.5 0 0 No	1 1 0.5 0.5 0.5 = 0	2 2 0.5 1 1 Yes	3 3 0 1.5 1.5 0 0	
11. Second or greater order channel  artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 8 )  12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 15. Sediment on plants or debris 16. Organic debris lines or piles 17. Soil-based evidence of high water table?  C. Biology (Subtotal = 5.75 ) 18. Fibrous roots in streambed 19. Rooted upland plants in streambed 20. Macrobenthos (note diversity and abundance) 21. Aquatic Mollusks	0 0 1.5 0 0 No	1 1 0.5 0.5 0.5 = 0	2 2 0.5 1 1 Yes 1 1 2	3 3 0 1.5 1.5 = 3	
11. Second or greater order channel  a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 8 )  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?  C. Biology (Subtotal = 5.75 )  18. Fibrous roots in streambed  19. Rooted upland plants in streambed  20. Macrobenthos (note diversity and abundance)  21. Aquatic Mollusks  22. Fish	0 0 1.5 0 0 No	1 1 0.5 0.5 0.5 = 0	2 2 0.5 1 1 Yes 1 1 1 2 2 2	3 3 0 1.5 1.5 3 0 0 0 3 3	
11. Second or greater order channel  artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 8 )  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris	0 0 0 1.5 0 0 No	1 0.5 0.5 0.5 = 0	Yes 2 2 0.5 1 1 Yes 2 2 1	3 3 3 0 1.5 1.5 3 0 0 0 3 3 3 1.5	
11. Second or greater order channel  artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 8 )  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?  C. Biology (Subtotal = 5.75 )  18. Fibrous roots in streambed  19. Rooted upland plants in streambed  20. Macrobenthos (note diversity and abundance)  21. Aquatic Mollusks  22. Fish  23. Crayfish	0 0 1.5 0 0 No	1 0.5 0.5 0.5 = 0	Yes 2  2  0.5  1  1  Yes 3  1  1  2  2  1  1	3 3 0 1.5 1.5 = 3 0 0 0 3 3 1.5 1.5	

Sketch:

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Cowardin Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 03 02080104 9/22/2015 Stream Name and Information Name(s) of Evaluator(s) 03-STR-15 L. Eggering 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Left descending bank Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: Lawns, mowed is narrow and then ligh Suboptima High Marginal: goes right to railroad Riparian areas ense herbaceou Riparian areas and maintained Low Poor: with tree stratum (dbh > 3 inches vegetation, riparian areas acking shrub and Non-maintained with tree stratum (dbh > 3 inches) reas, nurseries ballast. Field Sheet: ense herhaceou no-till cropland vegetation with either a shrub present, with Free stratum (dbh > 3 inches) preser STR-03-08. spoil lands, resent, with 30% to 60% tree actively grazed Riparian 30% tree canon tree stratum, hav pasture, sparsely vegetated non-maintained area, with > 60% tree canopy cover and ar enuded surface cover and a maintained roduction, ponds open water. If laver or a tree canopy cover an containing both row crops, active eed lots, trails, or **Buffers** on-maintained understory. Wetland layer (dbh > 3 inches) present, understory present, tree herbaceous and recently seeded ther comparable Recent cutove with <30% tree stratum (dbh >3 shrub layers or a non-maintained and stabilized, o conditions (dense vegetation). canopy cover. inches) present, with <30% tree understory anopy cover with maintained High High Low High Low Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank 1.5 Score : CI= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> 10% 90% 100% Rt Bank CI > 1.50 CI Left Bank Lt Bank CI > 0.5 0.54 1.02 Score > 0.85

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

0.51

0

CR = RCI X LF X IF

INSERT PHOTOS:



Left: Typical view of stream along railroad

Right: Typical view of stream along railroad

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

**Date:** 9/22/2015

03-STR-15

Project/Site. DC			9709
County: Spotsy	Ivania County	Longitude: -77	.460533
Stroem Dotormi	ination (circle one)	Other	
Epiterial inte	- Timitterit i ereilinai	e.g. Quad Name.	
Ahsent	Weak	Moderate	Strong
	1 1		3
			3
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0			1.5
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ditch per Bottomiano	d hardwards	ice Truck	,,
ditch per Bottomiano X chan	I hardwards		46.00
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	Stream Determine   Ephemeral   Interest	0 1 0 1 0 0 1 0 0 1 0 0 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0 0 1 0 0 0 0 0 1 0 0 0 0 0 1 0	Stream Determination (circle one)   Cother   e.g. Quad Name:

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		III I <i>)</i>			
Project #		Project Name		wadeable chan	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	03	VA	R4SB	02080104	9/22/2015		lengin	ractor	
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
	M. Rockwell	I				03-S7	ΓR-16				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal	conditional Categor	ry ginal	Po	or	Sev	ere	
	1	WA SHARE				less than Severe or	Overwiden		1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	on or natural rock, 100%). AND/OR /bankfull benches ess to their original by developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	ew areas of active table (60-80%). tion or natural rock -80%) AND/OR urres contribute to okfull and low flow Il defined. Stream o bankfull benches, of floodplains along each. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks frosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. iorary/transient in puting to instability.	Deeply incised vertical/lateral in incision, flow cor banks. Streambe rooting depth, rr vertical/lunderc protection present danks, is not pre Obvious bank sl. Erosion/raw ban AND/OR Aggradin	stability. Severe tained within the dd below average apority of banks ut. Vegetative in less than 20% of venting erosion. bughing present. ks on 80-100%.	
	10% of	on covers less than bottom.	sediment cover	s 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depos	nks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	С
Score		3	2	.4	:	2	1.	6	1		2.
DIDADIA	I DUEEEDS.	A b-sb-b	de 400 feet de ede		- anti-a CAD (as-		4		4-h-)		
2. RIPARIAI	N BUFFERS: /	Assess both bank	Con	an areas along the ditional Categorium	gory	ugh measuremen	ts of length & wid		table)		
2. RIPARIAI Riparian Buffers	Opti Tree stratum (dbh: with > 60% tree ca	imal  > 3 inches) present, anderstory. Wetlands	Con	ditional Cate	gory				,		
Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cu. non-maintained un	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	,		
Riparian	Opti Tree stratum (dbh: with > 60% tree canon-maintained unlocated within th	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious spoil lands, denuded surfaces, row crops, active feed jobs, active feed of other comparable conditions.	,		
Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow.	Opti Tree stratum (dbh: with > 60% tree canon-maintained unlocated within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream bani each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbin > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	,		
Riparian Buffers  Condition Scores  1. Delineate rip- descriptors. 2. Determine scorelow.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strain areas along quare footage for exparian Area and % Riparian Area>	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  .5  each stream bank each by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbin > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	,		
Riparian Buffers  Condition Scores  Delineate ripadescriptors. Delineate ripadescriptors. Example 1. Delinea	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strain areas along quare footage for experience and strain areas along quare along quare and strain areas along quare along quare along quare along quare along quare along quare along quare along quare along quare along quare along quare along quare along	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream bani each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbin > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	,	cores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate ripadescriptors. Delineate ripadescriptors. Example 1. Delinea	Tree stratum (dbh: with > 60% tree canon-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> \$\$Core >\$\$	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream baniesch by measurin Score for each ri 80% 1.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 20% 1.2	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbin > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	1.44	C
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. Right Bank Left Bank 3. INSTREAL	Tree stratum (dbh: with > 60% tree canon-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Score >  W HABITAT: Vi	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin  Score for each ri  80%  1.5  80%  1.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 1.2  20% 1.2  zes, water velocit	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. (	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	CI= (Sum % RA * S Rt Bank CI > Lt Bank CI >	1.44	C 1.4
Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  Jundercut banks;	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5  each stream bank each by measurin Score for each ri 80% 1.5  80% 1.5  aried substrate si iffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 1.2  20% 1.2  zes, water velocit exes, stable feature	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the condition of the condition	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >  Lt Bank CI >	1.44	
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree canon-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  W HABITAT: Viroot mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin Score for each ri 80% 1.5  80% 1.5  aried substrate si iffle poole completimal	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 1.2  20% 1.2  zes, water velocit exes, stable featur  Subo  Stable habitat elei	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. ( n the blocks below  ty and depths; wo res.  Conditiona ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  W.  In Category  Mary  Stable habitat ele	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to display the seeded and stabilized or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	CI= (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>> RR culvert s	1.44	
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	Tree stratum (dbh: with > 60% tree canon-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  W HABITAT: Viroot mats; SAV; r	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5  each stream bank each by measurin Score for each ri 80% 1.5  80% 1.5  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Kinto Condition C g or estimating le parian category in 20% 1.2  20% 1.2  zes, water velocit exes, stable featur  Subo  Stable habitat ele present in 30-50% are adequate fo	ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided at Category  Mar.  Stable habitat ele present in 10-30% are adequate for are provided at Category  Mar.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	CI= (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>> RR culvert s	1.44	

	St	ream Im	pact A	ssessm	ent Fo	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB	02080104	9/22/2015	03-STR-16		
	L ALTERATION: Stream cross poil piles, constrictions, livestock		Conditiona	I Category				NOTES>> Culvert prese	ent
	Negligible	Mir	nor	Mod	erate	Sev	rere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	disrupted by an	in the parameter OR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH C	ONDITION IN	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH		
IOTE: The Cls and F	RCI should be rounded to 2 decimal places.	The CR should be round	ded to a whole numbe	er.	•		THE REACH	CONDITION INF	OFX (RCI) >>

RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0



Top Left: View upstream toward culvert under railroad Top Right: View downstream Bottom Left: View of stream Bottom Right: View of stream

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

**Date:** 9/22/2015

03-STR-16

Evaluator: M. Rockwell	County: City of I	7.460158		
<b>Fotal Points:</b> 24.75 Stream is at least intermittent f ≥ 19 or perennial if ≥ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	:
A. Geomorphology (Subtotal = 11 )	Absent	Weak	Moderate	Strong
a. Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
B. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
I. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
B. Headcuts	(0)	1	2	3
). Grade control	0	0.5	1	1.5
0. Natural valley		0.5	1	1.5
Second or greater order channel		= 0	Yes	= 3
artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 6.5)	_			
2. Presence of Baseflow	(0)	1	2	3
3. Iron oxidizing bacteria	0	(1)	2	3
4. Leaf litter	1.5	$\rightarrow$	0.5	0
Sediment on plants or debris	0	0.5	1	1.5
Organic debris lines or piles	0	0.5		1.5
7. Soil-based evidence of high water table?		= 0	Yes	
C. Biology (Subtotal = 7.25)	L			
8. Fibrous roots in streambed	3	(2)	1	0
Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks		1	2	3
22. Fish	(0)	0.5	 1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; DBL		
*perennial streams may also be identified using other me	thods. See p. 35 of manual			
Notes: Stream stretch was channelized nea			odplain on both	sides of cree
Field Sheet Str02-08	·			
Sketch:				

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Impact Cowardin Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 03 ۷A 02080104 9/22/2015 Stream Name and Information Name(s) of Evaluator(s) L. Eggering 03-STR-17 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** Original data sheet Optimal Suboptimal Marginal missing. Given same Low Marginal: High Poor: ow Suboptima Non-maintained, dense herbaceou High Suboptima Lawns, mowed score as adjacent Riparian areas with tree stratum (dbh > 3 inches) High Marginal: Non-maintained, dense herbaceous Riparian areas with tree stratum (dbh > 3 inches) and maintained areas, nurseries; Low Poor: Impervious surfaces, mine stream. GIS name old vegetation, riparian areas no-till cropland: STR-01-08-02. lacking shrub and tree stratum, hay present, with vegetation with actively grazed pasture, sparsely vegetated non-Free stratum (dbh > 3 inches) presei resent, with 30% to 60% tree spoil lands. either a shrub layer or a tree layer (dbh > 3 30% tree canop cover and a Riparian with > 60% tree canopy cover and an non-maintained understory. Wetland nuded surfac Buffers roduction, ponds anopy cover an row crops, active open water. If maintained containing both herbaceous and shrub layers or a areas. maintained area feed lots, trails, or understory. Recent cutove inches) present, with <30% tree present, tree stratum (dbh >3 recently seeded and stabilized, or ther comparable (dense canopy cover. inches) present. non-maintained other comparable vegetation). with <30% tree understory. condition. canopy cover with maintained High High Low Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums escriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 80% 20% 100% Right Bank Score > 1.5 0.6 CI= (Sum % RA \* Scores\*0.01)/2 100% % Riparian Area> 100% Rt Bank CI > 1.32 CI Left Bank Score > 1.5 Lt Bank CI > 1.50 1.41

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> 0.71

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



View upstream at culvert carrying this stream under the railroad

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

**Date:** 9/22/2015

03-STR-17

Latitude: 38.274339

FACW = 0.75; OBL = 1.5 Other = 0

Evaluator: L. Eggering	County: Spotsylv	ania County	Longitude: -77	'.458706
<b>Total Points:</b> 0 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determin Ephemeral Inter			
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes :	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal =)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes :	= 3
C. Biology (Subtotal =)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
00.147.4	<del>  </del>		201 4 5 041 4	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: NC data for this resource not available (no field sheets).

GIS old stream name STR-01-08-02

26. Wetland plants in streambed

Sketch:

		Stre			sment		-	n 1)			
					nels classified as		*				
Project #	l	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	03	VA	R2SB	02080104	9/22/2015				
	e(s) of Evaluat		Stream Name	and Informa	tion	00.07	FD 40				
	L. Eggering						ΓR-18				
. Channel C	Condition: Asses	ss the cross-secti	on of the stream a		dition (erosion, age Conditional Categor	,					
	Opti	imal	Subo	ptimal	Mar	ginal	Po	or	Sev	rere	
	1	معر بع المحلف		ew areas of active	Poor. Banks more	less than Severe or stable than Severe	Overwiden Vertically/laterally	unstable. Likely to	Deeply incised		
Channel Condition	Very little incision or 100% stable banks. protection or natura (80-100%). AND, bars/bankfull ben Access to their orig fully developed wide Mid-channel bars, a few. Transient sec covers less than	Vegetative surface al rock, prominent /OR Stable point ches are present. ginal floodplain or e bankfull benches. and transverse bars diment deposition	of banks are s Vegetative protec prominent (60 Depositional feat stability. The bar channels are well d has access to ba newly developed portions of the s sediment covers 10	table (60-80%). tion or natural rock 80%) AND/OR tures contribute to hkfull and low flow efined. Stream likely nkfull benches, or floodplains along each. Transient )-40% of the stream tom.	60% of banks. S bevertical or unde 60% of stream is co Sediment may be t contribute instabili contribute to s' forming/present. A channels have vege		protection prese banks, and is insu erosion. AND/O stream is cover-	Erosion present on ks. Vegetative nt on 20-40% of fifticient to prevent R 60-80% of the ed by sediment. orary/transient in outing to instability. ed channels have ion is present on >	incision, flow contair Streambed below av majority of banks Vegetative protect than 20% of banks erosion. Obviou present. Erosion. 100%. AND/OR A Greater than 80%	erage rooting depth, vertical/undercut. ion present on less s, is not preventing s bank sloughing fraw banks on 80- ggrading channel. 6 of stream bed is tion, contributing to	CI
					features which cor		deposition	is absent.	and/or subte	rranean flow.	
Score	3	3		.4	4	2	1.	.6			1.6
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	forest on lef	t bank	
			High	Low	High	Low	High	Low			
Condition Scores	1.	5	1.2	1.1	0.85	0.75	0.6	0.5			
. Delineate ripa	arian areas along ea quare footage for ea Riparian Area and S % Riparian Area>	ach by measuring Score for each rips 80%	or estimating leng	th and width. Cal	· ·		of % R	he sums iparian qual 100			
J	Score >	1.5	0.6						CI= (Sum % RA * So	20res*0.01\/2	
	% Riparian Area>	100%						100%	Rt Bank CI >	1.32	CI
1.05	Score >	1.5							Lt Bank CI >	1.50	1.41
Left Bank				and donths: wood	y and leafy debris;	stable substrate;	low embededness	; shade;	NOTES>>		
B. INSTREAM	M HABITAT: Var root mats; SAV; riff			3.	al Category					sandy with	
B. INSTREAM		fle poole complex	es, stable features	3.	al Category	ginal	Po	or	Streambed s	•	
3. INSTREAN undercut banks;	root mats; SAV; riff	imal re typically present	Stable features  Subo  Stable habitat ele present in 30-50% adequate for r	Condition	Stable habitat eler present in 10-30% adequate for n	ginal ments are typically of the reach and are naintenance of attions.		listed above are estable. Habitat ally present in less		•	CI

#### **Stream Impact Assessment Form Page 2** Applicant HUC Locality Cowardin Class Data Point SAR length Project # Impact Factor CSX ۷A R2SB 02080104 9/22/2015 03-STR-18 N/A 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, NOTES>> spoil piles, constrictions, livestock Channelized below **Conditional Category** culvert Negligible Minor Moderate Severe 60 - 80% of reach is disrupted by an is disrupted by any of the channel Iterations listed i the parameter guidelines. If of the channel Iterations listed Less than 20% of the stream reach is 20-40% of the Channel stream reach is Greater than 80% of reach is disrupted the parameter by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, Channelization, dredging, alteration, o Alteration disrupted by any of disrupted by any guidelines. If hardening absent. Stream has an unaltered pattern or has naturalized. the channel erations listed i the channel tream has been channelized, stream has beer channelized, terations listed i the parameter the parameter riprap, or cement. normal stable normal stable guidelines. guidelines. stream meander pattern has not stream meander pattern has not recovered **SCORE** 1.5 1.3 0.9 0.7 0.5 1.30 1.1 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number 1.04 RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF



Top Left: Typical view downstream Top Right: Typical view downstream Bottom Left: Typical view

downstream



NC DWQ Stream Identification Form Version 4.11

03-STR-18

<b>Date:</b> 9/22/2015	Project/Site: DC2RVA - Area 03	Latitude: 38.274339
Evaluator: L. Eggering	County: Spotsylvania County	Longitude: -77.458706
<b>Total Points:</b> $39.75$ Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

ii = 19 or percrimarii = 90							
A. Geomorphology (Subtotal = 18.5)	Absent	Weak	Moderate	Strong			
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)			
2. Sinuosity of channel along thalweg	0	1	(2)	3			
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3			
4. Particle size of stream substrate	0	1	2	3			
5. Active/relict floodplain	0	1	2	3			
6. Depositional bars or benches	0	1	2	3			
7. Recent alluvial deposits	0	(1)	2	3			
8. Headcuts	(0)	1	2	3			
9. Grade control	0	0.5	1	1.5			
10. Natural valley	0	0.5	1	1.5			
11. Second or greater order channel	No	0 = 0	Yes = 3				
<sup>a</sup> artificial ditches are not rated; see discussions in manual							
B. Hydrology (Subtotal = 11.5)							
12. Presence of Baseflow	0	1	2	(3)			
13. Iron oxidizing bacteria	0	1	2	3			
14. Leaf litter	1.5	1	0.5	0			
15. Sediment on plants or debris	0	0.5	1	1.5			
16. Organic debris lines or piles	0	0.5	1	1.5			
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3			
C. Biology (Subtotal = $9.75$ )							
18. Fibrous roots in streambed	3	2	1	0			
19. Rooted upland plants in streambed	3	2	1	0			
20. Macrobenthos (note diversity and abundance)	0	1	2	3			
21. Aquatic Mollusks	0	1	2	3			
22. Fish	(0)	0.5	1	1.5			

/				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	(1)	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	0
·	•			

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Ludwigia palustris, Persicaria longiseta

Ordinary high water mark evident on this perennial stream. Field Sheet STR-01-08

Sketch:

	Ephe	mera		fied Stream N	Methodology 1			(For	m 1a)		
Project #		Project Name	9	For us	e in ephemeral s Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DO	C2RVA - Area	03	VA	R6	02080104	N/A				
Name	e(s) of Evalua	itor(s)	Stream Nam	e and Inform	ation						
						03-S	ΓR-19				
2. RIPARIAN	N BUFFERS:	Assess both bank				ugh measuremen	ts of length & wid	Ith may be accep	notes>>		
	Opt	Optimal Suboptimal Marginal Poor				Original data					
Riparian Buffers	with > 60% tree ca non-maintained un	> 3 inches) present, inches) present, aderstory. Wetlands aas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	sover and a	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory. Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Condition	1	.5	1.2	1.1	0.85	0.75	0.6	0.5	1		
descriptors.  2. Determine so below.	arian areas along quare footage for o	each stream ban	k into Condition C	Categories and Co	ondition Scores us Calculators are pr	sing the	Ensure of % F	the sums Riparian equal 100			
Right Bank	% Riparian Area>	1.2	0.6					10070	1		
	T								CI= (Sum % RA * So	· · · · · · · · · · · · · · · · · · ·	
Left Bank	% Riparian Area>	50% 1.2	50% 0.5					100%	Rt Bank CI >	1.11 0.85	0.98
				NDEX and S	TREAM CO	NDITION LIN	ITS FOR TH	IS REACH	uiik 01 /	5.05	0.30
NOTE: The Cls and I	RCI should be rounded								CONDITION IND	EX (RCI) >>	0.49
								R	CI= (Riparian CI)	/2	
									ON REQUIREM  IXLFXIF	ENT (CR) >>	0
DESCRIBE F	PROPOSED IN	MPACT:									

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date:

03-STR-19

weak 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	moderate 2 2 2 2 2 2 2	<b>Strong</b> 3 3 3
1 1 1 1 1 1 1	2 2 2 2 2 2	3
1 1 1 1 1 1 1	2 2 2 2 2 2	3
1 1 1 1 1 1	2 2 2 2 2	3
1 1 1 1	2 2 2	
1 1 1 1	2 2	3
1 1 1	2	
1 1		3
1		3
	2	3
	2	3
1	2	3
0.5	1	1.5
0.5	1	1.5
No = 0	Yes :	= 3
	-	
1	2	3
1	2	3
1	0.5	0
0.5	1	1.5
0.5	1	1.5
No = 0	Yes :	= 3
	1	
2	1	0
2	1	0
1	2	3
1	2	3
0.5	1	1.5
0.5	1	1.5
0.5	1	1.5
0.5	1	1.5
		<u>-                                      </u>
anı	FACW = 0.75; anual.	FACW = 0.75; OBL = 1.5 Other = 0 anual.

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral strea Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length Factor N/A DC2RVA - Area 03 02080104 9/22/2015 Name(s) of Evaluator(s) Stream Name and Information M. Rockwell 03-STR-20 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Right bank = row Optimal Suboptimal Marginal Poor crops Left bank = Low Marginal: High Poor: railroad track. Field Lawns, mowed, and maintained Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canop Low Poor: Impervious surfaces, mine Riparian areas with tree stratum (dbh > 3 inches) lense neroaceou: legetation, riparia areas lacking shrub and tree stratum, hay production, ponds open water. If present, tree stratum (dbh >3 inches) present Sheet STR-03-08. lon-maintained, nse herbaceou areas, nurseries, no-till cropland; actively grazed pasture, sparsely Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and an non-maintained understory. Wetlands vegetation with either a shrub resent, with 30% to 60% tree spoil lands, nuded surface: Riparian cover and a maintained understory. layer or a tree layer (dbh > 3 inches) present, with <30% tree Buffers anopy cover ar vegetated non-naintained area ow crops, active ed lots, trails, o containing both areas. herbaceous and shrub layers or a recently seeded and stabilized, or ther compara Recent cutover (dense vegetation). conditions canopy cover. inches) present with <30% tree her compara understory. condition. nopy cover wit maintained understory. High Low High Low High Low Condition 1.2 0.85 0.75 0.6 0.5 1.5 1.1 Scores escriptors. Determ for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter t 50% 100% Right Bank 0.5 1.2 I= (Sum % RA \* Scores\*0.01)/2 % Riparian Area 20% 80% 100% Rt Bank CI > 0.85 CI Left Bank 0.85 0.5 Lt Bank CI > 0.57 0.71 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number 0.36

CR = RCI X LF X IF

RCI= (Riparian CI)/2
COMPENSATION REQUIREMENT (CR) >>

0

### INSERT PHOTOS:



Top Left: View of stream bed Bottom Left: View of stream bed

Top Right: View of stream bed Bottom Right: View of stream bed

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

**Date:** 9/22/2015

03-STR-20

Evaluator: M. Rockwell	County: City of Fredericksburg, VA Longitude: -77.453378					
<b>Total Points:</b> 18.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name:	:		
II 2 19 01 pereriman II 2 30						
A O	Absort	Week	Madauata	Ctuana		
A. Geomorphology (Subtotal = 10.5 )	Absent	Weak	Moderate	Strong		
1 <sup>a.</sup> Continuity of channel bed and bank	0	1		3		
2. Sinuosity of channel along thalweg	0	1		3		
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3		
Particle size of stream substrate	0	1	2	3		
5. Active/relict floodplain	0	1	2	3		
6. Depositional bars or benches	<b>8</b>	1	2	3		
7. Recent alluvial deposits	(0)	1	2	3		
8. Headcuts	(0)	1	2	3		
9. Grade control	0	0.5)	1	1.5		
10. Natural valley	0	0.5	1	1.5		
11. Second or greater order channel		o = 0	Yes			
<sup>a</sup> artificial ditches are not rated; see discussions in manual						
B. Hydrology (Subtotal = 4.5)						
12. Presence of Baseflow	(0)	1	2	3		
13. Iron oxidizing bacteria		1	2	3		
14. Leaf litter	1.5	1	0.5	0		
15. Sediment on plants or debris	0	0.5	<del></del>	1.5		
16. Organic debris lines or piles	0	0.5	<del></del>	1.5		
17. Soil-based evidence of high water table?		0 = 0	Yes			
C. Biology (Subtotal = <u>3.75</u> )				<i>y</i>		
18. Fibrous roots in streambed	3	2	1	0		
Rooted upland plants in streambed	3	2	1			
Nooted upland plants in streambed     Macrobenthos (note diversity and abundance)	Ő	1	2	3		
21. Aquatic Mollusks		1	2	3		
22. Fish		0.5	1	1.5		
23. Crayfish		0.5	1	1.5		
24. Amphibians	Ö	0.5	<u> </u>	1.5		
25. Algae		0.5	1	1.5		
		FACW = 0.75; DB	1 - 1 5 Othor - (			
26. Wetland plants in streambed  *perennial streams may also be identified using other method	ada Caan 25 of manus	<del></del>	L = 1.5 Other = t	)		
Notes: Field Sheet STR-03-08	ous. See p. 33 of manua	11.				
Notes. Theid Sheet STR-03-00						
Sketch:						

## **Ephemeral Stream Assessment Form (Form 1a)**

Unified Stream Methodology for use in Virginia

	For use in ephemeral streams									
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor		
N/A	DC2RVA - Area 03	VA	R6	02080104	9/22/15					

Name(s) of Evaluator(s) Stream Name and Information

L. Eggering 03-STR-21

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

			NOTES>>								
	Optima	ıal	Subo	ptimal	Mar	ginal	Po	oor	This ephen	neral side	İ
Riparian Buffers	Tree stratum (dbh > 3 i with > 60% tree canop non-maintained unders areas.	py cover and an story. Wetlands	containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.		Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	channel flows into 08- STR-03. Field Sheet: STR-04-08.		
			High	Low	High	Low	High	Low	1		İ
Condition Scores	1.5		1.2	1.1	0.85	0.75	0.6	0.5			
	arian areas along each			•				the sums			
3. Enter the % F	Riparian Area and Sco	ore for each rip	arian category in	the blocks below.			Blocks 6	qual 100			
Dight Donk	% Riparian Area>	100%						100%			
Right Bank	Score >	1.5							1		ĺ
									CI= (Sum % RA * \$	Scores*0.01)/2	
Left Bank	% Riparian Area>	10%	90%					100%	Rt Bank CI >	1.50	0
Leit Dalik	Coore :	4.5	0.6						LA Danie CL.	0.60	4

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

1.5

0.6

THE REACH CONDITION INDEX (RCI) >> 0.55

RCI= (Riparian CI)/2

Lt Bank CI >

COMPENSATION REQUIREMENT (CR) >> 0

1.10

0.69

CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: View downstream from data point Bottom Right: View upstream from data point



NC DWQ Stream Identification Form Version 4.11

03-STR-21

Date: 9/22/2015	Project/Site: DC2RVA - Area 03	Latitude: 38.262209
Evaluator: L. Eggering	County: Spotsylvania Co., VA	Longitude: -77.452854
<b>Total Points:</b> 12.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*	Epitemeral Intermittent Ferenman e.g. Quad Name.					
A. Geomorphology (Subtotal = 5.5 )	Absent	Weak	Moderate	Strong		
1 <sup>a.</sup> Continuity of channel bed and bank	0	1_	(2)	3		
2. Sinuosity of channel along thalweg	0	(1)	2	3		
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3		
4. Particle size of stream substrate	0	1	2	3		
5. Active/relict floodplain	0	1	2	3		
6. Depositional bars or benches	0	1	2	3		
7. Recent alluvial deposits	0	1	2	3		
8. Headcuts	(O)	1	2	3		
9. Grade control	0	0.5	1	1.5		
10. Natural valley	0	0.5	1	1.5		
11. Second or greater order channel	No	= 0	Yes:	= 3		
a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = $5.5$ )						
12. Presence of Baseflow	(0)	1	2	3		
13. Iron oxidizing bacteria	0	1_	2	3		
14. Leaf litter	1.5	(1)	0.5	0		
15. Sediment on plants or debris	0	0.5	1	1.5		
16. Organic debris lines or piles	0	0.5		1.5		
17. Soil-based evidence of high water table?	No	= 0	Yes:	= 3		
C. Biology (Subtotal = 1.75)						
18. Fibrous roots in streambed	3	2	1	0		
19. Rooted upland plants in streambed	3	2	1	0		
20. Macrobenthos (note diversity and abundance)	0	1	2	3		
21. Aquatic Mollusks	0	1	2	3		
22. Fish	(0)	0.5	1	1.5		

 18. Fibrous roots in streambed
 3
 2
 1
 0

 19. Rooted upland plants in streambed
 3
 2
 1
 0

 20. Macrobenthos (note diversity and abundance)
 0
 1
 2
 3

 21. Aquatic Mollusks
 0
 1
 2
 3

 22. Fish
 0
 0.5
 1
 1.5

 23. Crayfish
 0
 0.5
 1
 1.5

 24. Amphibians
 0
 0.5
 1
 1.5

 25. Algae
 0
 0.5
 1
 1.5

 26. Wetland plants in streambed
 FACW = 0.75; BL = 1.5 Other = 0

 \*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Ephemeral channel flows out of study area. Field Sheet STR04-08

Sketch:

Sketch:

Channel wetland

FLOW

sample outside study area point

field

Floodplain

Forest

field

		Stre	Unit	fied Stream M	lethodology f	or use in Virg		m 1)			
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAF	R Impact Factor	
N/A	DC	2RVA - Area	03	VA	R4SB	02080104	12/1/2015		iength	racior	
	e(s) of Evalua		-	e and Informa							
	K. Astroth					03-S	ΓR-22				
I. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
Optimal			Subo	ptimal	onditional Categor	ry ginal	Po	or	Se	evere	
	1 J	W.	Olimbia in tradit	ew areas of active		less than Severe or	Overwiden		Deanly incise	ed (or excavated),	
Channel Condition	100% stable bal surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	n or natural rock, 00%). AND/OR bankfull benches ass to their original y developed wide Mid-channel bars, ars few. Transient on covers less than	erosion or unproted of banks are sit Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope portions of the rasediment cover	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient is 10-40% of the bottom.	or Poor due to lo Erosion may be pr both banks. Vegel 40-60% of banks. bevertical or under 60% of strean sediment. Se temporaryltran instability. Depositic stability, may be AND/OR V-shap vegetative protecti	stable than Severe wer bank slopes.  sesent on 40-60% of  tative protection on  Streambanks may  rout. AND/OR 40- n is covered by  diment may be  sient, contribute  on that contribute to  forming/present.  ed channels have  on on > 40% of the  onal features which	widen further. Maj are near vertical. 60-80% of ban protection prese banks, and is insue erosion. AND/Of stream is covere Sediment is temp nature, and contril AND/OR V-shape vegetative protecti 40% of the bar	ority of both banks crosion present on ks. Vegetative nt on 20-40% of lifficient to prevent R 60-80% of the ed by sediment. lorary/transient in outing to instability. ed channels have on is present on > loks and stable	vertical/lateral incision, flow co banks. Store cm rooting depth, vertical/unde protection preser banks, is not p Obvious bank Erosion/raw b AND/OR Aggrad than 80% of stredeposition, cont Multiple threa	instability. Severe ontained within the bed below average majority of banks rocut. Vegetative at on less than 20% of reventing erosion. Sloughing present. anks on 80-100%. Inig channel. Greater am bed is covered by ributing to instability. d channels and/or d channels and/or	
						to stability.			Subtern	anean flow.	С
Score	1 3	3	2	.4	<u> </u>	2	1.	.b	<u> </u>	1	2.4
	Opti	imal			gory				NOTES>>		
Riparian Buffers	with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	7 -	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	woods FLO	woods W	
	with > 60% tree ca non-maintained und	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	woods FLO	547	
Buffers	with > 60% tree ca non-maintained und	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	woods FLO	W	
	with > 60% tree ca non-maintained und	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or of other comparable conditions.	woods FLO	w nal ilvert	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	with > 60% tree connon-maintained und located within the located withi	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  .5  each stream ban each by measurin Score for each ri	High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 20%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canop cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and County in the blocks below 10%	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	woods FLO	w		
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the %	with > 60% tree connon-maintained und located within the located withi	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. (and the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums stiparian qual 100	woods FLO	nal Ilvert cks/ballast		
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % l	with > 60% free cc non-maintained un located within th  1. arian areas along a quare footage for e Riparian Area and % Riparian Area> \$core >  % Riparian Area>	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 70% 1.2	High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category it  20%  1.1	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. (and the blocks below 10% 0.75	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums stiparian qual 100	woods  FLO  margin cu trai	onal ilvert cks/ballast  Scores*0.01)/2  1.14	C	
Condition Scores  1. Delineate rip descriptors. 2. Determine st pelow. 3. Enter the % I	with > 60% free cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream baneach by measurin 70% 1.2  70% 1.2	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 1.1	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Co ngth and width. ( n the blocks below 10% 0.75	Mary High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) gower (dbh > 3	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel ots, trails, or other comparable conditions.  Low 0.5  the sums tiparian qual 100 100%	woods  FLOV  margir Cu tran  Cl= (Sum % RA* Rt Bank Cl > Lt Bank Cl >	mal livert cks/ballast	C
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Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/ Available	with > 60% free cc non-maintained uni located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  M HABITAT: Va ; root mats; SAV; r  Opti Habitat elements a	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  -5  -5  -6  -6  -6  -6  -70%  -	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 1.1  zes, water velocit exes, stable featur Subo Stable habitat ele present in 30-50%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 1.75  10% 0.75  10% 0.85  ty and depths; wores.  Conditiona	High Marginal: Non-maintained, when with either a shrub layer or a tree layer (3bh > 3 middle of the canopy cover.  High  0.85  Indition Scores us Calculators are provided the canopy cover.  All Category  Marginal Category  Stable habitat elepresent in 10-309	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums liparian qual 100 100%  100%	woods  FLOV  margir  cu  trad  Cl= (Sum % RA*  Rt Bank Cl>  Lt Bank Cl>  NOTES>>	onal ilvert cks/ballast  Scores*0.01)/2  1.14	1.1
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### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor N/A CSX R4SB 02080104 12/1/2015 03-STR-22 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Culvert associated with Claiborne Road Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. CI SCORE 1.5 1.3 1.1 0.9 0.7 0.5 1.30 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF INSERT PHOTOS: Top Left: View upstream toward tracks Top Right: View downstream away from tracks Bottom Left: Culvert associated with Claiborne Road DESCRIBE PROPOSED IMPACT:

NC DWQ Stream Identification Form Version 4.11

03-STR-22

1.5

1.5

Date: 12/1/2015	Project/Site: DC2RVA - Area 03	Latitude: 38.196655
Evaluator: K. Astroth	County: Spotsylvania County	Longitude: -77.439744
<b>Total Points:</b> 29.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*				
		W <sub>2</sub> =1	Madazia	01::
A. Geomorphology (Subtotal = 14	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	2	(3)
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	$\bigcirc$	2	3
5. Active/relict floodplain	0		2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	1	<b>(2)</b>	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	( No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 6				_
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	$\bigcirc$	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	(No	0 = 0	Yes	= 3
C. Biology (Subtotal = $9.25$ )				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
				· -

0.5

0.5

FACW = 0.75; OBL = 1.5 Other = 0

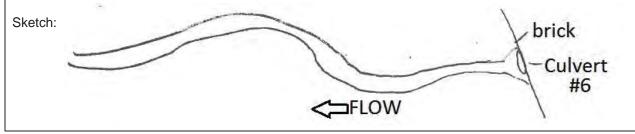
\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Originates from Culvert 6. Field Sheet 10-A-STR-02.

24. Amphibians

26. Wetland plants in streambed

25. Algae



0

		<b>O</b> 1.1 O	am A	fied Stream N		or use in Virg	jinia			l.
Drainat #		Draigat Nama		wadeable chan	nels classified a			CAD#	Impact/SAR	Impact
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor
N/A Nam	e(s) of Evaluation	2RVA - Area		VA e and Informa	R2SB	02080105	12/1/2015			
INAIII	K. Astroth	ior(s)	Stream Nam	e and informa	ation	03-S	ΓR-23			
Channel C	Condition: Asse	ess the cross-sec	tion of the stream	n and prevailing co	ondition (erosion,					
	Opti	mal	Subo	ptimal c	onditional Catego	ginal	Po	or	Sev	vere
	1	AND SHAPE	3	<u></u>		ess than Severe or	Overwiden		1	5
Channel Condition	Very little incision o 100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba- sediment depositio	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars, ars few. Transient	erosion or unprote of banks are s Vegetative protec prominent (60 Depositional feat stability. The bar channels are we likely has access t or newly develope portions of the r	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream to bankfull benches, of floodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositiv stability, may be	esent on 40-60% of ative protection on Streambanks may rcut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/Of stream is covere Sediment is temp nature, and contrit AND/OR V-shape	ority of both banks crosion present on ks. Vegetative to 10-40% of fficient to prevent R 60-80% of the ad by sediment. orary/transient in outing to instability. ad channels have	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious banks le Erosion/raw ban	(or excavated), stability. Severe trained within the below average najority of banks tut. Vegetative on less than 20% of eventing erosion. oughing present. iks on 80-100%. g channel. Greater
	10% of bottom.		sediment covers 10-40% of the stream bottom.		AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.				than 80% of stream bed is covered by deposition, contributing to instability.  Multiple thread channels and/or subterranean flow.	
Score	3	<b>B</b>	2	.4	:	2	1.	6	1	1
NOTES>>	N BUFFERS: A	Assess both bank	's 100 foot riparia			ugh measuremen		th may be accep	table)	
	N BUFFERS: A		Con		e entire SAR. (roo	ugh measuremen			NOTES>>	d
	Opti	mal  3 inches) present, unopy cover and a lerstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh 2 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the	e entire SAR. (roo	ugh measuremen	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.		railroa woody	d Wetland 4
RIPARIAN	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the	mal  3 inches) present, nopy cover and a derstory. Weltands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	an areas along the ditional Cate(ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	railroa woody	Wetland 4
Riparian Buffers  Condition Scores  Delineate ripascriptors. Determine scolow.	Tree stratum (dbh > with > 60% tree canon-maintained und located within the	mal  3 inches) present, nopy cover and a lerstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 300 present, with 300 to 60% tree canopy cover and containing both herbaceous and shroth layers or a hroth layers herbaceous and shroth layers herbaceo	an areas along the ditional Categories and Congth and width. Categories and Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.250/">https://doi.org/10.250/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	railroa woody	Wetland 4
Riparian Buffers  Condition Scores  Delineate ripa Secriptors. Determine scolow. Enter the % 6	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	mal  3 inches) present, nopy cover and a letrestory. Wellands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and herbaceous and shrub layers or a non-maintained understory.  High 1.2  Linto Condition C g or estimating le parian category in	an areas along the ditional Categories and Congth and width. Categories and Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.250/">https://doi.org/10.250/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100	railroa woody	Wetland 4
Riparian Buffers  Condition Scores  Delineate ripascriptors. Determine scolow.	Tree stratum (dbh > with > 60% tree canon-maintained und located within the	mal  3 inches) present, nopy cover and a lerstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 300 present, with 300 to 60% tree canopy cover and containing both herbaceous and shroth layers or a hroth layers herbaceous and shroth layers herbaceo	an areas along the ditional Categories and Congth and width. Categories and Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.250/">https://doi.org/10.250/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	woody	Wetland 4 \$ FLOW
Riparian Buffers  Condition Scores  Delineate ripascriptors. Determine solow. Enter the % F	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	mal  3 inches) present, nopy cover and a letrestory. Wellands e riparian areas.  5  ach stream band ach by measurin Score for each ri	High Suboptimal: Riparian areas with tree stratum (dbh 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Interpretation of the condition n areas along the ditional Categories and Congth and width. Categories and Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.250/">https://doi.org/10.250/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100	railroa woody	Wetland 4  Cores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate ripa Secriptors. Determine scolow. Enter the % 6	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	mal  3 inches) present, nopy cover and a letrstory. Wellands e riparian areas.  5  each stream bani ach by measurin Score for each ri 90% 1.5	High Suboptimal: Riparian areas With tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Kinto Condition C g or estimating le parian category in 10%  1.2	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (an the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.250/">https://doi.org/10.250/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	woody  Cl= (Sum % RA * S	Wetland 4 \$ FLOW
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Riparian Buffers  Condition Scores  Delineate ripascriptors. Determine scolow. Enter the % if Right Bank  Left Bank  INSTREAI	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	mal  3 inches) present, nopy cover and a deterstory. Wetlands er riparian areas.  5  ach stream banl ach by measurin 90% 1.5  60% 1.2  aried substrate si ffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Cinto Condition C g or estimating le parian category is 10% 1.2  20% 0.85  Zes, water velocit xes, stable featu	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Coungth and width. Coungth and width. Coungth and width. Coungth and depths; wores.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the control of the con	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the povided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious provided in the sums iparian qual 100 100%	NOTES>> railroa woody  CI= (Sum % RA * S Rt Bank CI > Lt Bank CI >	Wetland 4  PLOW  Cores*0.01)/2  1.47
Riparian Buffers  Condition Scores  Delineate ripascriptors. Determine scolow. Enter the % Fi Right Bank  Left Bank  INSTREAL Instream Habitat/	Tree stratum (dbh > with > 60% tree conon-maintained unclocated within the located within	mal  3 inches) present, nopy cover and a deterstory. Wetlands er riparian areas.  5  ach stream banl ach by measurin 90% 1.5  60% 1.2  aried substrate si ffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  cinte Condition C g or estimating le parian category in 10% 1.2  20% 0.85  zes, water velocii xxes, stable featu	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 1.5)  20%  0.5  by and depths; wores.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer of a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicate the canopy cover.  All Category  Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer of a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  ing the povided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>> railroa woody  CI= (Sum % RA * S Rt Bank CI > Lt Bank CI >	Wetland 4  PLOW  Cores*0.01)/2  1.47
Riparian Buffers  Condition Scores  Delineate rips scriptors. Determine scolow. Enter the % f Right Bank  Left Bank  INSTREAR dercut banks; Instream	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	mal  3 inches) present, unopy cover and a lerstory. Wetlands er iparian areas.  5  ach stream band ach by measurin 90% 1.5  60% 1.2  aried substrate si fflie poole comple	High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and containing both herbaceous and containing both herbaceous and containing both herbaceous and containing both herbaceous and containing both herbaceous and containing both herbaceous and understory.  High 1.2  cinto Condition Co g or estimating le parian category in 10% 1.2  20% 0.85 zes, water velocit xes, stable featu  Subo  Stable habitat ele present in 30-50% are adequate for	an areas along the ditional Categoriem al Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. Congth and width. Congth and depths; wo res. Conditionaptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Ing the povided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%  100%	NOTES>> railroa Woody  Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl> NOTES>>	Wetland 4  PLOW  Cores*0.01)/2  1.47

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor R2SB 02080105 12/1/2015 03-STR-23 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Culvert associated with Claiborne Road Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. CI SCORE 1.5 0.5 1.3 1.1 0.9 0.7 1.30 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF

#### **INSERT PHOTOS:**



Top Right: View of stream away from the railroad

Bottom: Left: Beaver dam

NC DWQ Stream Identification Form Version 4.11

03-STR-23

Date: 12/1/2015	Project/Site: DC2RVA - Area 03	Latitude: 38.189613
Evaluator: K. Astroth	County: Spotsylvania County	Longitude: -77.447812
<b>Total Points:</b> 37.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 18.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	$\rightarrow$	2	3
ripple-pool sequence	U	(1)		3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $9.5$				_
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	
C. Biology (Subtotal = $9.5$ )		_		
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5		1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed			OBL = 1.5 Other = 0	
*perennial streams may also be identified using other metho	ods. See p. 35 of manua			
Notes: Beaver dam backing up flow and pushing	•		aided channels star	ting near
culvert. Field Sheet 10-A-STR-01.		<u> </u>		9
1.70	ediament e semille			
OKCIOII.	WETLAND 4	/		
riffle Ba	B	eaver Dam		
Tie See	1		1	
/ The	*		· 1	
riffle			Sec.	
	<	FLOW	1	
		74.6.94	culvert #2	

		Stre					(For	m 1)			
				fied Stream N wadeable chan							
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area		VA	R2SB	02080105	12/2/2015				
Nam	e(s) of Evaluat	tor(s)	Stream Nam	e and Informa	ation	20.07	<b>FD 04</b>				
21 14	K. Astroth						ΓR-24				
Channel	Condition: Asse			C	Conditional Catego	ry			1 0		
	Opti	mai	Subo	ptimal	Mar	ginal	Po	or	Sev	/ere	
	"Les	معرید هملاب				less than Severe or stable than Severe	Overwiden Vertically/laterally		1	5	
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-10 Stable point bars/t are present. Acces floodplain or fully	nks. Vegetative or or natural rock, 00%). AND/OR bankfull benches ss to their original	erosion or unproter of banks are s Vegetative protec prominent (60 Depositional feat stability. The bar channels are we	ew areas of active cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strear sediment. Se	stable than severe ower bank slopes, esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- ns covered by diment may be sient, contribute	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/OI stream is covere Sediment is temp	ority of both banks crosion present on ks. Vegetative on 20-40% of fficient to prevent a 60-80% of the ed by sediment.	incision, flow cor banks. Streambe rooting depth, m vertical/underd protection present of banks, is not pre	stability. Severe ntained within the ed below average najority of banks cut. Vegetative on less than 20% of eventing erosion.	
	bankfull benches. I and transverse ba sediment deposition 10% of b	Mid-channel bars, ars few. Transient in covers less than	or newly develope portions of the r sediment cover	o bankfull benches, d floodplains along reach. Transient rs 10-40% of the bottom.	instability. Depositi stability, may be AND/OR V-shap vegetative protect banks and deposit	istent, contribute on that contribute to on that contribute to forming/present. ed channels have ion on > 40% of the ional features which to stability.	nature, and contrit AND/OR V-shape vegetative protecti 40% of the bar	outing to instability. ed channels have on is present on > nks and stable	Erosion/raw ban AND/OR Aggradin	g channel. Greater n bed is covered by outing to instability. channels and/or	CI
Score	3		2	4		2	1.	6	1	1	2.4
RIPARIAI	N BUFFERS: A	ssess both bank	s's 100 foot riparia								
						ugh measuremen	ts of length & wide	h may be accep			
	Opti	mal	Con	ditional Cate	gory		ts of length & wide		NOTES>>	wing down	
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	· 3 inches) present, nopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy	gory	ginal  Low Marginal:  Non-maintained, dense herbaceous vegetation,			NOTES>> Stream flow access roa	_	
Buffers	Tree stratum (dbh > with > 60% tree ca	· 3 inches) present, nopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) presentl with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> Stream flow access roa	id.	
Buffers	Tree stratum (dbh > with > 60% tree ca	3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Stream flow access roa	id.	
Condition Scores  Delineate rip: secriptors. Determine so	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	3 inches) present, nopy cover and a letestory. Wetlands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Stream flow access roa	id.	
Condition Scores  Delineate ripsocriptors. Determine solow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	3 inches) present, nopy cover and a letestory. Wetlands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Stream flow access roa	id.	
Condition Scores  Delineate rips scriptors. Determine solow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the strain areas along equare footage for earlian Area and % Riparian Area >	3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.  5  each stream ban ach by measurin Score for each r 85% 1.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 10% 1.1	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 5% 0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	NOTES>> Stream flow access road  access road  Cl= (Sum % RA * S	sample point	
Condition Scores  Delineate ripsocriptors. Determine solow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the strain areas along equare footage for earlian Area and % Riparian Area >	3 inches) present, nopy cover and a terstory. Wetlands e riparian areas.  5 each stream ban ach by measurin Score for each r	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Stream flor access road	sample point	CI 1.41
Condition Scores  Delineate rips scriptors. Determine sclow. Enter the % I Right Bank  INSTREAL	Tree stratum (dbh > with > 60% tree ca a non-maintained und located within the located wi	3 inches) present, nopy cover and a leerstory. Wetlands riparian areas.  5  each stream ban ach by measurin  Score for each r  85%  1.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le sparian category in 10% 1.1	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 5% 0.5  ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Calculators are provided in the control of the c	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, traits, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Stream flow access road  access road  Cl= (Sum % RA * S Rt Bank Cl >	cores*0.01)/2	CI 1.41
Condition Scores  Delineate rip. scriptors. Determine sclow. Enter the % I Right Bank  Left Bank  INSTREAI dercut banks;	Tree stratum (dbh > with > 60% tree ca anon-maintained und located within the located wit	3 inches) present, nopy cover and a leerstory. Wetlands riparian areas.  5  each stream ban ach by measurin  Score for each r  85%  1.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le sparian category in 10% 1.1	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. ( n the blocks belov 5% 0.5  5% 0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Calculators are production of the condition  ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, traits, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Stream flow access road  access road  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2		
Condition Scores  Delineate rips scriptors. Determine sclow. Enter the % I Right Bank  INSTREAL dercut banks; Instream	Tree stratum (dbh > with > 60% tree ca a non-maintained und located within the located wi	3 inches) present, nopy cover and a leterstory. Wetlands riparian areas.  5  sach stream ban ach by measuring Score for each riparian areas.  1.5  85% 1.5  unied substrate siffle poole complete.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 10% 1.1  10% 1.1  Subo Subo	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. ( In the blocks below 5% 0.5  5% 0.5  ty and depths; wo res.  Conditiona ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-more and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en B	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 1005  Low 1006  Low 1009  L	NOTES>> Stream flow access road  access road  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2	
Condition Scores  Delineate rip: secriptors. Determine scolow. Enter the % I Right Bank  Left Bank  INSTREAI dercut banks; Instream Habitat/ Available	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	3 inches) present, nopy cover and a leterstory. Wetlands riparian areas.  5  ach stream ban ach by measuring score for each rest 1.5  85% 1.5  aried substrate siffle poole complete the poole complete the typically present the typically present the retypically present th	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 10% 1.1  10% 1.1  Subo Stable habitat ele present in 30-50% are adequate fo	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. ( n the blocks below 5% 0.5  ty and depths; wo res.  Conditiona ptimal  ments are typically % of the reach and r maintenance of	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided and leafy del al Category  Mar  Stable habitat ele present in 10-30 are adequate for a for a	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically % of the reach and remaintenance of	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks ends and stabilized of the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, traits, or other comparable conditions.  Low 0.5  Low 10.5	NOTES>> Stream flow access road  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	cores*0.01)/2	1.41
Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	3 inches) present, nopy cover and a leerstory. Wetlands riparian areas.  5  beach stream ban ach by measurin 85% 1.5  85% 1.5  aried substrate siffle poole comple mal et typically present 1% of the reach.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 10% 1.1  10% 1.1  Subo Stable habitat ele present in 30-509 are adequate fo popul	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 5% 0.5  5% 0.5  ty and depths; wores.  Conditional ments are typically & of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  W.  Stable habitat ele present in 10-30° are adequate for popul	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically & of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks end and stabilized and	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%  100%	NOTES>> Stream flow access road  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	cores*0.01)/2	

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX	R2SB	02080105	12/2/2015	03-STR-24				
	ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, conc		concrete blocks, s	straightening of ch	hannel, channeliz	ation,	NOTES>> Flows acro	oss access
	Negligible	Mii	nor	Mode	erate	Sev	ere	road.	
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH C	ONDITION II	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH		
OTE: The CIs and R	CI should be rounded to 2 decimal places. I	The CR should be roun	ded to a whole numb	er.			THE REACH	CONDITION IN	DEX (RCI) >>
							RC	I= (Sum of all C	l's)/5

#### INSERT PHOTOS:





Top Left: View upstream toward culvert under railroad

Top Right: View downstream into woods away from railroad

Bottom Left: View upstream of stream and adjacent gasline ROW

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

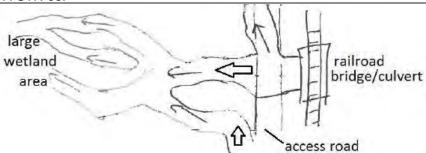
NC DWQ Stream Identification Form Version 4.11

03-STR-24

Date: 12/2/2015	Project/Site: DC2RVA - Area 03	Latitude: 38.181464
Evaluator: K. Astroth	County: Spotsylvania County	Longitude: -77.453078
<b>Total Points:</b> $37.25$ Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$	Stream Determination (circle one) Ephemeral Intermitter Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 17)	Absent	Weak	Moderate	Strong	
a. Continuity of channel bed and bank	0	(1)	2_	3	
2. Sinuosity of channel along thalweg	0	7	(2)	3	
3. In-channel structure: ex. riffle-pool, step-pool,	0		2	3	
ripple-pool sequence	U				
Particle size of stream substrate	0	1	(2)	3	
5. Active/relict floodplain	0	1	2	(3)	
6. Depositional bars or benches	0	(1)	2	3	
7. Recent alluvial deposits	0	1	2	3	
3. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
0. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	No	0 = 0	Yes:	= 3	
artificial ditches are not rated; see discussions in manual	•				
3. Hydrology (Subtotal = 9					
2. Presence of Baseflow	0	1	2	(3)	
3. Iron oxidizing bacteria	0	1)	2	3	
4. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	$\bigcirc$	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	No	0 = 0	Yes = 3		
C. Biology (Subtotal = <u>11.25</u> )					
8. Fibrous roots in streambed	3	(2)	1	0	
<ol><li>Rooted upland plants in streambed</li></ol>	(3)	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3	
21. Aquatic Mollusks	(0)	1	2	3	
22. Fish	0	0.5		1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		ACW = 0.75;	OBL = 1.5 Other = 0	)	
*perennial streams may also be identified using other method					
Notes: Stream branches after bridge and flows d			d throughout a large	e wetland are	

Sketch:



		Stre		SSESS fied Stream N			า (For	m 1)			
			For use in	wadeable chan		s intermittent or	perennial				
Project #	ı	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Area 03 e(s) of Evaluator(s) Stream Name and		VA	R2SB	02080105	12/2/2015					
	e(s) of Evalua tchell, M. Ro		Stream Nam	e and informa	ation	03-6	ΓR-25				
	Condition: Asse		tion of the stream	and prevailing c	ondition (erosion		111-23				
	Opti				Conditional Catego		Po	or	Say	/ere	
		WAR THE STATE OF T	The state of the s		Often incised, but	less than Severe or	Overwiden	ed/incised.	1		
Channel Condition	surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or full) bankfull benches. and transverse ba	inks. Vegetative in or natural rock, 100%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, aars few. Transient on covers less than	erosion or unproted of banks are sit Vegetative protect prominent (60-Depositional feat stability. The bar channels are wel likely has access to or newly develope portions of the right sediment cover	tion or natural rock -80%) AND/OR tures contribute to okfull and low flow Il defined. Stream o bankfull benches, d floodplains along reach. Transient as 10-40% of the	or Poor due to Ic Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran instability. Depositi stability, may be AND/OR V-shap	stable than Severe were bank slopes, esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by indiment may be sisient, contribute on that contribute to forming/present. ed channels have on on > 40% of the	widen further. Maj	ority of both banks rosion present on ks. Vegetative int on 20-40% of fficient to prevent 6 60-80% of the by sediment. orary/transient in unting to instability. de channels have on is present on >	vertical/lateral in incision, flow cor banks. Streamler rooting depth, rr vertical/underc protection present of banks, is not pre Obvious bank sl. Erosion/raw bank AND/OR Aggradin than 80% of stream	najority of banks cut. Vegetative on less than 20% of eventing erosion. oughing present. lks on 80-100%. g channel. Greater n bed is covered by	
			Stream	bottom.	banks and deposit	ional features which to stability.			deposition, contrib Multiple thread subterran	channels and/or	(
Score	3	3	2	.4		2	1.	6	1	1	2.
NOTES>>						`	ntors listed)				
2. RIPARIAI	N BUFFERS: A	Assess both bank	d's 100 foot riparia	an areas along the	antira CAD /ra						
						ugh measuremen	ts of length & wid	h may be accep			
	Opti	imal	Con	ditional Cate	gory	ugh measuremen ginal	ts of length & wid		NOTES>>	vithin	
Riparian Buffers	Tree stratum (dbh : with > 60% tree ca	> 3 inches) present, anopy cover <mark>and a</mark> derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate	gory						
Buffers	Tree stratum (dbh: with > 60% tree cc non-maintained und located within th	> 3 inches) present, anopy cover <mark>and a</mark> derstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Wetlands v		
Condition Scores  1. Delineate ripidescriptors. 22. Determine scobelow.	Tree stratum (dbh swith > 60% tree or non-maintained un located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located lo	> 3 inches) present, anopy cover and a detestory. Wetlands le riparian areas.  .5  each stream ban each by measurin Score for each r	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Wetlands v		
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I	Tree stratum (dbh swith > 60% tree or non-maintained un located within the located within	> 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Wetlands v	ea.	
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Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/ Available	Tree stratum (dbh with > 60% tree canon-maintained una located within the located within	> 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  -5  -5  -6  -6  -6  -6  -7  -7  -7  -7  -7  -7	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in  izes, water velocit exes, stable featur  Subo Stable habitat ele present in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the condition ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically & of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks end and stabilized and	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or lots romparable conditions.  Low 0.5  Low 100%  100%  100%  100%	NOTES>> Wetlands v riperian ard  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	cores*0.01)/2	C 1.3	
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th  1. arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  M HABITAT: Va root mats; SAV; r	> 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each r 100% 1.2  100% 1.2  aried substrate si iffle poole comple imal are typically present io% of the reach.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  in a category	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below the product of the blocks below the product o	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area pasture, sparsely vegetated non-maintained and stabilized, or other comparable condition.  High  0.6  Ensure to f % R Blocks end Blocks	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%  100%  101%	NOTES>> Wetlands v riperian ard  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	cores*0.01)/2	

#### **Stream Impact Assessment Form Page 2** Locality Cowardin Class HUC Data Point Project # Applicant Date SAR length Impact Factor R2SB 02080105 12/2/2015 03-STR-25 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. is disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has been guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not cement. guidelines. guidelines. recovered. recovered. CI SCORE 1.5 1.3 1.1 0.9 0.7 0.5 1.30 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF

INSERT PHOTOS:

Top Left: View upstream to culvert under railroad

Bottom Right: View downstream from tracks, includes galine ROW

NC DWQ Stream Identification Form Version 4.11

03-STR-25

1.5

1.5

1.5

Date: 12/2/2015	Project/Site: DC2RVA - Area 03	Latitude: 38.18185
Evaluator: D. Mitchell, M. Rockwell	County: Spotsylvania	Longitude: -77.453733
<b>Total Points:</b> 42.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*	=priomorai mio	T Grown	e.g. quad Hamoi	
A. Geomorphology (Subtotal = 20.5	Absent	Weak	Moderate	Strong
1 <sup>a</sup> Continuity of channel bed and bank	0	1	2	(3)
Sinuosity of channel along thalweg	0	1	2	(3)
In-channel structure: ex. riffle-pool, step-pool,	0	ı		<u> </u>
ripple-pool sequence	0	1	(2)	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 10				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5	0	1.5
16. Organic debris lines or piles	0	0.5	0	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 12.25 )	·	_		
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	1		3
21. Aquatic Mollusks	0	1	<b>(2)</b>	3
22. Fish	0	0.5	1	1.5

0.5

0.5

0.5

IACW = 0.75 OBL = 1.5 Other = 0

\*perennial streams may also be identified using other methods. See p. 35 of manual.

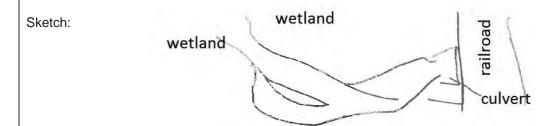
23. Crayfish

25. Algae

24. Amphibians

26. Wetland plants in streambed

Notes: Same stream as Stream 4, upstream from last location. Field Sheet 10-STR-05-upstream.



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		Stre	am A		ment lethodology f		_	ııı ı <i>,</i>			
					nels classified as						
Project #	ı	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Area 03			VA	R2	02080105	N/A				
Name	e(s) of Evaluat	tor(s)	Stream Name	e and Informa	ation	00.07	FD 00				
						03-S7	R-26				
I. Channel C	Condition: Asse	ss the cross-sec	tion of the stream		ondition (erosion, Conditional Categor						
	Opti	mal	Subo	ptimal		ginal	Po	or	Sev	/ere	
		- WAR	Slightly incised, fe	ew areas of active	Often incised, but I	ess than Severe or stable than Severe	Overwiden Vertically/laterally			(or excavated),	
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-11 Stable point bars/l are present. Acce floodplain or fully bankfull benches. and transverse ba sediment depositio 10% of I	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars, urs few. Transient n covers less than	erosion or unproted of banks are st Vegetative protect prominent (60-Depositional feat stability. The ban channels are wel likely has access to or newly developer portions of the r sediment cover	cted banks. Majority table (60-80%). Italie (60-80%) AND/OR ures contribute to ktfull and low flow II defined. Stream to bankfull and loans along reach. Transient s 10-40% of the bottom.	or Poor due to lo Erosion may be pre both banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sec temporary/trans instability. Depositic stability, may be AND/OR V-shape	wer bank slopes, seent on 40-60% of attive protection on Streambanks may rout. AND/OR 40- is covered by diment may be sient, contribute on that contribute to forming/present. ed channels have	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu- erosion. AND/OI stream is cover Sediment is temp nature, and contril AND/OR V-shape vegetative protecti	ority of both banks rosion present on ks. Vegetative int on 20-40% of fficient to prevent 6 60-80% of the by sediment. orary/transient in unting to instability. de channels have on is present on >	incision, flow cor banks. Streamber rooting depth, n vertical/underc protection present of banks, is not pre Obvious bank sle Erosion/raw bar AND/OR Aggradin	oughing present. iks on 80-100%. g channel. Greater n bed is covered by	
			Stream	DOLLOTT.	banks and deposition		40% of the bar sediment depos			channels and/or	
Score	3	3	2	.4	contribute		1.	6		1	2.4
	_				-	_	l .			-	
NOTES>>	GIS Stream is labeled as 10-B-STR-05 same stream as Field Sheet 10-A-STR-03, those number to fill in this form since the data sheet is missing.										
				ını ını una ıd	566	ne uata sine	et io illiooi	ng.			
Mar				illi illi tillis it	Jiii	ne uata sne	et is illissi	ng.			
Mar						ne data site	et is illissi	ng.	NOTES		
<i>l</i> lar	Opti	mal	Con	ditional Cate	gory	ginal	Po		NOTES>>		
Mar Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	· 3 inches) present, inopy cover and a lerstory. Wetlands	Con- Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate	gory				NOTES>>		
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	· 3 inches) present, inopy cover and a lerstory. Wetlands	Con- Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>>		
Riparian	Tree stratum (dbh > with > 60% tree ca	3 inches) present, nopy cower and a derstory. Wetlands e riparian areas.	Con- Subop High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>		
Riparian Buffers  Condition Scores  1. Delineate ripalescriptors. 2. Determine squeezelow.	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	3 inches) present, nopy cover and a ferstory. Wetlands e riparian areas.	Con- Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating let	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dhb > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>		
Riparian Buffers  Condition Scores  Delineate ripa tescriptors. Determine squelow.	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the	3 inches) present, nopy cover and a ferstory. Wetlands e riparian areas.	Con- Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating let	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dhb > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>		
Riparian Buffers  Condition Scores  Delineate ripalescriptors. Determine squelelow.	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5 each stream banl ach by measurin Score for each rice and a score for eac	Con- Subop High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating ler parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dhb > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate ripalescriptors. Determine squelow. Enter the % F. Right Bank	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	5 sach stream bani ach by measurin Score for each ri 85% 1.5	Con- Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating let parian category in 10% 1.1	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 5% 0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dhb > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	CI≕ (Sum % RA * S		CI
Riparian Buffers  Condition Scores  Delineate ripa escriptors. Determine squelow. Enter the % F	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located loc	3 inches) present, nopy cover and a letristory. Weltlands e riparian areas.  5  each stream band ach by measurin Score for each rises.	Con- Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating ler parian category in 10%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dhb > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5		cores*0.01)/2 1.41 1.41	CI 1.41
Riparian Buffers  Condition Scores  Delineate ripelescriptors. Determine squelow. Right Bank  Left Bank  B. INSTREAN	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	5  ach by measurin Score for each ri 85% 1.5  aried substrate si	Con- Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both horbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating let parian category ir 10% 1.1  10% 1.1	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 5% 0.5  5% 0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  calculators are prov.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	CI= (Sum % RA * S Rt Bank CI >	1.41	
Condition Scores  1. Delineate ripe descriptors. 2. Determine squelow. 3. Enter the % F Right Bank  Left Bank  3. INSTREAN undercut banks;	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	5  ach by measurin Score for each ri 85% 1.5  aried substrate si	Con- Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both horbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating let parian category ir 10% 1.1  10% 1.1	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. ( n the blocks below 5% 0.5  5% 0.5  y and depths; wores.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dhh > 3 inches) present, with <30% tree canopy cover.  High  0.85 Indition Scores us Calculators are provided to the condition of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	Cl≕ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	1.41	
Condition Scores  1. Delineate ripe descriptors. 2. Determine so- pelow. 3. Enter the % F Right Bank  Left Bank  3. INSTREAL undercut banks; Instream	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	5  Score for each ri 85% 1.5  aried substrate siffle poole comple	Con- Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating let parian category in  10%  1.1  10%  1.1  zes, water velocit exes, stable feature	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 5% 0.5  5% 0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dhh > 3 inches) present, with <30% tree canopy cover.  High  0.85 Indition Scores us Calculators are provided to the condition of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  ing the povided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums iparian qual 100  100%  100%	Cl≕ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	1.41	
Condition Scores  Delineate rips descriptors. Deltermine squelow. B. Enter the % F Right Bank  Left Bank  Left Bank  Instream Habitat/ Available	Tree stratum (dbh > with > 60% tree canon-maintained uncolocated within the located withi	5  Score for each ris 85% 1.5  aried substrate siffle poole comple	Con- Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating let parian category in  10%  1.1  10%  1.1  zes, water velocit exes, stable featur  Subop  Stable habitat eler present in 30-50%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. ( n the blocks belov  5% 0.5  5% 0.5  conditiona ptimal ments are typically 6 of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dh) > 3 inches) present, with <30% tree canopy cover.  High 0.85 Indition Scores us Calculators are provided to the condition of the condition	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  ing the povided for you  ginal ments are typically 6 of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks end  Habitat elements lacking or are ur	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100 100%  100%  Ilisted above are istable. Habitat	Cl≕ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	1.41	
Condition Scores  1. Delineate ripa descriptors. 2. Determine squelow. 3. Enter the % F Right Bank  Left Bank  3. INSTREAN undercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	5  Score for each ris 85% 1.5  aried substrate siffle poole comple	Con- Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating ler parian category in 10% 1.1  2es, water velocit exes, stable featur  Subop  Stable habitat eler present in 30-509 are adequate for	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. (and the blocks below 5% 0.5  5% 0.5  Ly and depths; wo res.  Conditional ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Acalculators are proved the second of the s	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the povided for you  ginal ments are typically 6 of the reach and rmaintenance of	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  Blocks en  High  High  Blocks en  Blocks en  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	Cl≕ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	1.41	

	St	ream In	npact A	ssessm	ent For	m Pag	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2	02080105	N/A	03-STR-26			
4. CHANNEL	L ALTERATION: Stream cross	ings, riprap, conc	crete, gabions, or	concrete blocks,	straightening of ch	hannel, channeli	zation,	NOTES>>		
embankments, s	poil piles, constrictions, livestock		Conditiona							
	Negligible	Mi	nor		erate	Se	vere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than disrupted by ar alterations listed guidelines AND/ shored with g	80% of reach is ny of the channel I in the parameter OR 80% of banks abion, riprap, or nent.			CI
SCORE	1.5	1.3	1.1	0.9	0.7	C	).5			1.10
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IIS REACH			
NOTE: The CIs and R	RCI should be rounded to 2 decimal places. T	he CR should be roun	nded to a whole numb	er.				CONDITION IN		
							COMPENSATI	I= (Sum of all C		0
						<u> </u>		I X LF X IF	(01.) //	U
INSERT PHO	OTOS:									
DESCRIBE E	PROPOSED IMPACT:									
DESCRIBE F	PROPOSED IMPACT:									

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date:

03-STR-26

Latitude: 38.176267

Evaluator:	County: Spotsyl	vania	Longitude: -77	.457317		
<b>Total Points:</b> 37.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) mitter Perennial	Other e.g. Quad Name:	Other e.g. Quad Name:		
A. Geomorphology (Subtotal = 17	Absent	Weak	Moderate	Strong		
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3		
Sinuosity of channel along thalweg	0	Y	2	3		
3. In-channel structure: ex. riffle-pool, step-pool,	0		2	3		
ripple-pool sequence						
Particle size of stream substrate	0	1	(2)	3		
5. Active/relict floodplain	0	1	2	3		
6. Depositional bars or benches	0	(1)	2	3		
7. Recent alluvial deposits	0	1	2)	3		
8. Headcuts	0	1	2	3		
9. Grade control	0	0.5	1	1.5		
10. Natural valley	0	0.5	1	1.5		
11. Second or greater order channel	No	= 0	Yes :	= 3		
<sup>a</sup> artificial ditches are not rated; see discussions in manual						
B. Hydrology (Subtotal = 9)						
12. Presence of Baseflow	0	1	2	(3)		
13. Iron oxidizing bacteria	0	(1)	2	3		
14. Leaf litter	1.5	1	0.5	0		
15. Sediment on plants or debris	0	0.5		1.5		
16. Organic debris lines or piles	0	0.5	1 _	1.5		
17. Soil-based evidence of high water table?	No	= 0	Yes:	= 3		
C. Biology (Subtotal = 11.25)	<u>'</u>	1				
18. Fibrous roots in streambed	3	(2)	1	0		
19. Rooted upland plants in streambed	(3)	2	1	0		
20. Macrobenthos (note diversity and abundance)		1	(2)	3		
21. Aquatic Mollusks	0	1	2	3		
22. Fish	0	0.5		1.5		
23. Crayfish	0	0.5	(1)	1.5		
24. Amphibians	0	0.5	1	1.5		
25. Algae	0	0.5	$\overline{}$	1.5		
26. Wetland plants in streambed			BL = 1.5 Other = 0	)		
*perennial streams may also be identified using other met	nods. See p. 35 of manual					
Notes: Field Sheets are missing used numbers			is the same stream	m only on the		
east side of the tracks.						
Sketch:						

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Cowardin Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Segment 10 02080105 12/2/2015 Stream Name and Information Name(s) of Evaluator(s) 03-STR-27 K. Astroth 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Field Sheet 10-A-Suboptimal Marginal Low Marginal: Non-maintained, High Poor: Lawns, mowed STR-04. ligh Suboptima High Marginal: Riparian areas ense herbaceou Riparian areas and maintained Low Poor: vegetation, riparian areas with tree stratur Non-maintained with tree stratum (dbh > 3 inches) reas, nurseries (dbh > 3 inches ense herhaceou Heavily wooded ave DBH 2-6" no-till cropland vegetation with either a shrub present, with acking shrub and Tree stratum (dbh > 3 inches) presen spoil lands, resent, with 30% to 60% tree actively grazed Riparian wooded with gaps 30% tree canon tree stratum, hav pasture, sparsely vegetated non-maintained area, with > 60% tree canopy cover and ar enuded surface cover and a maintained roduction, ponds open water. If laver or a tree canopy cover an containing both row crops, active eed lots, trails, or **Buffers** on-maintained understory. Wetland layer (dbh > 3 inches) present, understory present, tree herbaceous and recently seeded ther comparable Recent cutove with <30% tree stratum (dbh >3 shrub layers or a non-maintained and stabilized, o conditions. (dense vegetation). canopy cover. inches) present, with <30% tree understory canopy cover with maintained High High Low High Low Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores access road Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 60% 30% 100% Right Bank 0.5 1.2 1.1 CI= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> 90% 10% 100% Rt Bank CI > 1.10 CI Left Bank 0.5 1.12 Score > 1.2 Lt Bank CI > 1.13 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number THE REACH CONDITION INDEX (RCI) >> 0.56 RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF INSERT PHOTOS: Top Left: View downstream



NC DWQ Stream Identification Form Version 4.11

03-STR-27

Date: 12/2/2015	Project/Site: DC2RVA - Area 03	Latitude: 38.173774
Evaluator: K. Astroth	County: Caroline County	Longitude: -77.458107
<b>Total Points:</b> 16 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral ntermittent Perennial	Other e.g. Quad Name:

Absent	Weak	Moderate	Strong
0	1	2	3
0	Y	(2)	3
0	1	2	3
0	(1)	2	3
0	1	2	3
(0)	11	2	3
0	1	2	3
0	1	2	3
0	0.5	1	1.5
0	0.5	1	1.5
(No	0 = 0	Yes:	= 3
0	1	(2)	3
0	1	2	3
1.5	1	0.5	0
0	0.5	1	1.5
	0.5	1	1.5
	0 = 0	Yes:	= 3
3	(2)	1	0
(3)	2	1	0
0	(1)	2	3
0	1	2	3
0	0.5	1	1.5
(0)	0.5	1	1.5
0	0.5	1	1.5
0	0.5	1	1.5
	FACW = 0.75; (	OBL = 1.5 Other = 0	
See p. 35 of manua	l.		
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 0.5 0 0.5 0 0.5 0 0.5 No = 0  No = 0  3 2 0 1 0 1 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5	0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 0 1 2 0 0 5 1 0 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 FACW = 0.75; OBL = 1.5 Other = 0

		Stre				Form for use in Virg	(For	m 1)			
5		Day is at Name			nels classified a	s intermittent or		045 "	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A Nam		2RVA - Area	03 Stream Nam	VA	R2SB	02080105	12/2/2015				
	e(s) of Evalua chell, M. Roc	. ,	Stream Nam	e and imornia	ation	03-57	ΓR-28				
	Condition: Asse		etion of the stream	and prevailing of	andition (erosion		111 20				
· Onamior c					onditional Catego	ry	Po	O.	Sev	TOTO .	
	Opti	IIIIai	Subo	pumai	IVIAI	ginal	1	OI	Jev	A A	
	-	Who have		ew areas of active	Poor. Banks more	less than Severe or stable than Severe	Overwidene Vertically/laterally u	unstable. Likely to	Deeply incised	(or excavated),	
Channel Condition	Very little incision of 100% stable bar surface protection prominent (80-1). Stable point bars/are present. Acce floodplain or fully bankfull benches. and transverse be	n or natural rock, 00%). AND/OR bankfull benches ass to their original or developed wide Mid-channel bars,	of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock .80%) AND/OR ures contribute to takfull and low flow II defined. Stream to bankfull benches, d floodplains along	Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Set temporary/tran instability. Depositiv.	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Major are near vertical. E 60-80% of bank protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contributed.	rosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in: incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sk Erosion/raw ban	attained within the ed below average najority of banks ut. Vegetative on less than 20% of eventing erosion. bughing present.	
	sediment depositio 10% of	n covers less than	sediment cover	each. Transient s 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have ion on > 40% of the ional features which to stability.	AND/OR V-shape vegetative protection 40% of the barn sediment depos	on is present on > aks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1		2.4
NOTES>>				ı	Field Sheet	10-STR-04					
lor.											
/lar			Con	ditional Cate	norv				NOTES>>		
	Opti	imal	Subo			ginal	Po	or	NOTES		
Riparian Buffers		anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present,	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed			
			non-maintained understory.	(dense vegetation).	with <30% tree canopy cover.	present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	maintained area, recently seeded and stabilized, or other comparable condition.	lots, trails, or other comparable conditions.			
Com dist			non-maintained	(dense		stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	maintained area, recently seeded and stabilized, or other comparable	lots, trails, or other comparable			
Condition Scores	1.	5	non-maintained understory.	(dense vegetation).	canopy cover.	stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	maintained area, recently seeded and stabilized, or other comparable condition.	lots, trails, or other comparable conditions.			
Scores  Delineate ripelescriptors. Determine solelow.	1. arian areas along of quare footage for e	each stream ban each by measurin	non-maintained understory.  High 1.2  k into Condition C	Low 1.1 ategories and Congth and width. (	High 0.85 Indition Scores us	stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	maintained area, recently seeded and stabilized, or other comparable condition.	lots, trails, or other comparable conditions.			
Delineate ripe escriptors. Determine so elow. Enter the % I	arian areas along of quare footage for e Riparian Area and % Riparian Area>	each stream ban each by measurin Score for each r 20%	non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 80%	Low 1.1 ategories and Congth and width. (	High 0.85 Indition Scores us	stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	lots, trails, or other comparable conditions.			
Delineate ripe escriptors. Determine so elow. Enter the % I	arian areas along of quare footage for e Riparian Area and	each stream ban each by measurin Score for each r	non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in	Low 1.1 ategories and Congth and width. (	High 0.85 Indition Scores us	stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	lots, trails, or other comparable conditions.	Cl⊨ (Sum % RA * Sr	pores*0.01)/2	
Scores  Delineate ripiescriptors. Determine scielow. Enter the % I	arian areas along of the plants area and which area and which area area area area area area area are	each stream ban each by measurin Score for each r 20% 1.2	non-maintained understory.  High 1.2  k into Condition C g or estimating lest parian category in 80% 1.1	Low 1.1 ategories and Congth and width. (	High 0.85 Indition Scores us	stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	lots, trails, or other comparable conditions.	Cl= (Sum % RA * Si Rt Bank Cl >	1.12	CI
Scores  Delineate rip: escriptors. Determine scelow. Enter the % I  Right Bank  Left Bank	arian areas along u quare footage for e Riparian Area and % Riparian Area> Score >	each stream ban ach by measurin Score for each r 20% 1.2 15% 1.2	high 1.2 k into Condition C g or estimating le iparian category in 80% 1.1	Low 1.1 ategories and Congth and width. Conthe blocks below	High  0.85  Indition Scores us Calculators are prov.	stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks ed	Low 0.5  Les sums iparian qual 100 100%	Cl= (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	,	CI 1.12
Delineate ripe escriptors. Determine sc elow. Enter the % I Right Bank	arian areas along of the plants area and which area and which area area area area area area area are	each stream ban ach by measurin Score for each r 20% 1.2 15% 1.2 aried substrate si	non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 80% 1.1  85% 1.1	Low 1.1 ategories and Congth and width. Con the blocks below	High  0.85  Indition Scores us Calculators are prov.	stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks ed	Low 0.5  Les sums iparian qual 100 100%	Cl= (Sum % RA * Si Rt Bank Cl >	1.12	
Scores  Delineate ripescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAI	guare footage for e  Riparian Area and  % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Va root mats; SAV; ri	each stream ban each by measurin Score for each r 20% 1.2 15% 1.2 aried substrate si	High 1.2 k into Condition C g or estimating le iparian category in 80% 1.1 85% 1.1 izes, water velocitexes, stable feature	Low 1.1 ategories and Congth and width. Congth and width. Congth and depths; wo res. Conditiona	High 0.85  Addition Scores us Calculators are prov.	stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ed  ate; low embeded	Low 0.5  Le sums iparian qual 100 100%  100%	Cl= (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	1.12	
Scores  Delineate riprescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/	warian areas along of puare footage for expansion Area and % Riparian Area Score > % Riparian Area Score > % Riparian Area Score > % HABITAT: Varoot mats; SAV; ri	seach stream ban ach by measurin Score for each r 20% 1.2 15% 1.2 aried substrate si iffle poole comple	non-maintained understory.  High 1.2  k into Condition C g or estimating le sparian category in 80% 1.1  85% 1.1  izes, water velocitexes, stable feature.  Subol Stable habitat elei	Low 1.1 ategories and Congth and width. Congth and width. Congth and depths; wo res. Conditionaptimal	High  0.85 Indition Scores us Calculators are prov.  Ody and leafy det Il Category  Mary Stable habitat ele	stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  pris; stable substrations; stable substrations are typically ments are typically	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ex  Blocks ex  High	Low 0.5  Low 0.5  Low 0.5  Low 0.5  Low 0.6  Low 0.7  Low 0.7  Low 0.7  Low 0.7  Low 0.8  Low 0.7  Low 0.7  Low 0.8  Low 0.7  Low 0.8  Low 0.7  Low 0.8  Low 0.9  Low	Cl= (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	1.12	
Scores  Delineate riplescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream	warian areas along of puare footage for expansion Area and % Riparian Area Score > % Riparian Area Score > % Riparian Area Score > % HABITAT: Varoot mats; SAV; ri	seach stream ban ach by measurin 20% 1.2 15% 1.2 aried substrate si ffle poole comple imal	high  1.2 k into Condition C g or estimating le iparian category in 80% 1.1  85% 1.1  izes, water velocitexes, stable featur Subop Stable habitat ele present in 30-50y are adequate fo	Low 1.1 ategories and Congth and width. Congth and depths; wores. Conditionaptimal	High  0.85  Indition Scores us Calculators are prov.  Ody and leafy det Il Category  Mar.  Stable habitat ele present in 10-309 are adequate for are adequate for are adequate for are adequate for are adequate for are adequate for are adequate for are adequate for are adequate for a format f	stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  ate; low embeded	Low  0.5  Low  0.5  ne sums iparian qual 100  100%  100%  Isted above are istable. Habitat	C⊫ (Sum % RA * Si Rt Bank Cl > Lt Bank Cl > NOTES>>	1.12	

										Г
	St	ream In	npact A	ssessm	ent For	rm Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX	•	VA	R2SB	02080105	12/2/2015	03-STR-28			
embankments, s	ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, cond			straigntening of ci	nannei, channeiiz	ation,	NOTES>> Culvert an	d railroad	
	Negligible	Mi	Conditiona nor		erate	Sev	ere	access roa	ad.	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter OR 80% of banks bion, riprap, or			CI
SCORE	1.5	1.3	1.1	0.9	0.7	0				1.30
NOTE: The Ole and D				TREAM CO	NDITION UN			CONDITION IN	DEV (BCI)	
NOTE: The CIS and R	CI should be rounded to 2 decimal places. 1	ne CR should be roul	ided to a whole numb	er.				I= (Sum of all C		
								ON REQUIRE	MENT (CR) >>	0
INSERT PHO	OTOS:						CK = KC	IALFAIF		
						Top Left: Vie	ew upstream railroad	toward culve	ert under	
	Bottom Right: View down	stream								
DESCRIBE F	PROPOSED IMPACT:									

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

03-STR-28

1.5

Latitude: 38.17115

Evaluator: D. Mitchell, M. Rockwell	County:		Longitude: -77	.459003
Total Points: $35$ Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$		nation (circle on rmitten Perenni		
A. Coomorphology, (Cubistal 15	Absent	Weak	Mod <u>e</u> rate	Strong
A. Geomorphology (Subtotal = 15 )  1 <sup>a</sup> Continuity of channel bed and bank	Absent 0	1 1	(2)	Strong 3
				3
Sinuosity of channel along thalweg     In-channel structure: ex. riffle-pool, step-pool,	0		2	3
ripple-pool sequence	0	(1)	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	<u> </u>	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	0 = 0	Yes =	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual	·			
B. Hydrology (Subtotal = 8.5)				
12. Presence of Baseflow	0	1_	(2)	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5	$\bigcirc$	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	) = 0	Yes =	= 3
C. Biology (Subtotal = 11.5				
0. Blology (Subtotal = 11.5)				
18. Fibrous roots in streambed	3	(2)	1	0
	3 3	2	1	0 0
18. Fibrous roots in streambed		2	1	0 3
Fibrous roots in streambed     Rooted upland plants in streambed	3	1		0
18. Fibrous roots in streambed     19. Rooted upland plants in streambed     20. Macrobenthos (note diversity and abundance)	3 0	1	1	0 3
Fibrous roots in streambed     Rooted upland plants in streambed     Macrobenthos (note diversity and abundance)     Aquatic Mollusks	3 0 0	1	1	0 3 3

Sketch:

25. Algae

26. Wetland plants in streambed

Notes: Field Sheet 10-STR-04.

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Date: 12/2/2015

0

0.5

FACW = 0.75; OBL = 1.5 Other = 0

		Stre		SSESS fied Stream N			-	· · · · · · ·			
Project #		Project Name		wadeable chan	nels classified a	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact	
•		•		•	Class.			SAR#	length	Factor	
N/A Nam	ne(s) of Evaluat	2RVA - Area tor(s)		VA e and Informa	R2SB ation	02080105	12/1/2015				
	tchell, M. Roo					03-ST	R-29a				
. Channel C	Condition: Asse	ess the cross-sec	tion of the stream	n and prevailing co	ondition (erosion,	aggradation)					
	Opti	mal	Subo	ptimal c	onditional Categor	ry ginal	Po	or	Sev	vere	
	1	Who have	1	ير.	Often incised, but I	less than Severe or	Overwiden		1	5	
Channel Condition	Very little incision of 100% stable bar surface protection prominent (80-11 Stable point bars%) are present. Acce floodplain or fully bankfull benches. and transverse bars to the stable point bars to the stable point bars.	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches iss to their original of developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, dfloodplains along reach. Transient	or Poor due to lo Erosion may be pre both banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sec temporary/trans instability. Depositio stability, may be	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is inst. erosion. AND/OI stream is cover Sediment is temp nature, and contril AND/OR V-shapi	ority of both banks crosion present on ks. Vegetative nt on 20-40% of officient to prevent R 60-80% of the ad by sediment. ovary/transient in outing to instability, ad channels have	roting depth, r vertical/underc protection present of banks, is not pre Obvious bank sla Erosion/raw ban	stability. Severe tatained within the ed below average najority of banks sut. Vegetative on less than 20% of eventing erosion. Dughing present.	
	sediment deposition 10% of I	bottom.	stream	rs 10-40% of the bottom.	vegetative protecti banks and depositi contribute	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depor	nks and stable sition is absent.	than 80% of stream deposition, contrib Multiple thread subterran	n bed is covered by outing to instability. channels and/or lean flow.	(
Score	3	3	2	.4	:	2	1.	.6	1	l	2
<b>l</b> lar											
Mar	Opti	mal		ditional Cateon Ptimal		ginal	Po	oor	NOTES>>		
Mar Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	<ul> <li>3 inches) present, anopy cover and a derstory. Wetlands</li> </ul>	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree			ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a href="documents">30%</a> tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>		
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	<ul> <li>3 inches) present, anopy cover and a derstory. Wetlands</li> </ul>	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>>		
Riparian	Tree stratum (dbh > with > 60% tree ca	• 3 inches) present, anopy cower and a derstory. Wetlands e riparian areas.	Suboj  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	Mary High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious straites, mine spoil lands, denuded surfaces, row crops, active feed obs, trails, or other comparable conditions.	NOTES>>		
Riparian Buffers  Condition Scores  Delineate rip lescriptors. 2. Determine so	Tree stratum (dbh > with > 60% tree canon-maintained und located within the	3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>>		
Riparian Buffers  Condition Scores  Delineate rip lescriptors. Determine so	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	3 inches) present, anopy cover and a terstory. Wetlands e riparian areas.  5  each stream ban ach by measurin Score for each ri 100%	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>>		
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine scelow.	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	- 3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban ach by measurin Score for each ri	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums stiparian qual 100	NOTES>>  C⊫ (Sum % RA * S	cores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % Right Bank	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	5  sach stream ban ach by measurin Score for each ri 100% 1.2	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums stiparian qual 100	CI= (Sum % RA * S Rt Bank CI >	1.20	C
Condition Scores  Delineate riplescriptors. Determine scoledw. Enter the % Right Bank	Tree stratum (dbh > with > 60% tree can non-maintained unclocated within the located with	5  sach stream ban ach by measurin Score for each ri 100% 1.2	Subori High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both chortaining both shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low 1.1  Categories and Co	High Marginal: Non-maintained, use yegetation with either a shrub layer or a tree layer (9th > 3 months of the canopy cover.  High  0.85  Indition Scores use calculators are prove.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums liparian qual 100 100%	Cl≕ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >		C 1.:
Condition Scores  Delineate rip lescriptors. Determine so leslow. Right Bank  Left Bank  B. INSTREAL	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	5  sach stream ban ach by measurin 100% 1.2 aried substrate si	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. (	High Marginal: Non-maintained, Non-maintained, Vegetation with either a shrub layer or a tree layer (3) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums liparian qual 100 100%	CI= (Sum % RA * S Rt Bank CI >	1.20	
Condition Scores  Delineate riplescriptors. Determine scelow. Right Bank  Left Bank  B. INSTREAL Indercut banks;	Tree stratum (dbh > with > 60% tree canon-maintained mid to located within the located wi	5  Score for each ri 100% 1.2  aried substrate siffle poole comple	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating leparian category in parian category in the parian cat	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Co ngth and width. (	High Marginal: Non-maintained,	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums liparian qual 100 100%	Cl≕ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	1.20	
Condition Scores  Delineate rip descriptors. Determine scores  Enter the % Right Bank  Left Bank  Instream Habitat/ Available	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	5  sach stream ban ach by measurin 100% 1.2 100% 1.2 aried substrate siffle poole comple	Subol  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in 2 parian category in 2 parian category in 3 parian categor	ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. Co n the blocks below  by and depths; wo res.  Conditiona ptimal ments are typically % of the reach and	High Marginal: Non-maintained, Venemaintained,	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically % of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums liparian qual 100 100% 100%	Cl≕ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	1.20	1.
Riparian Buffers  Condition Scores  Delineate rip lescriptors. Determine scoelow. Enter the % Right Bank  Left Bank  Instream Habitat/	Tree stratum (dbh > with > 60% tree canon-maintained mithin the located within the locate	5  sach stream ban ach by measurin 100% 1.2  100% 1.2  aried substrate si iffle poole completimal re typically present 0% of the reach.	Suboy  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Suboy are adequate fo popul	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditional primal ments are typically	High Marginal: Non-maintained,	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substrations are typically ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e  High  High  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums tiparian qual 100 100%  100%	Cl≕ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	1.20	

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	csx		VA	R2SB	02080105	12/1/2015	03-STR-29a		
	ALTERATION: Stream cross poil piles, constrictions, livestock	sings, riprap, conc	rete, gabions, or		straightening of ch	hannel, channeliz	cation,	NOTES>> Culvert as	
	Negligible	Mir	nor		erate	Sev	rere	with Claibo	orne Road
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with ga cem	y of the channel in the parameter OR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5		
	REACH C	ONDITION II	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: View downstream

Top Right: View upstream toward culvert under railroad

Bottom Left: View downstream Bottom Right: View upstream

NC DWQ Stream Identification Form Version 4.11

03-STR-29a

Date: 12/1/2015	Project/Site: D0	C2RVA - Area 03	Latitude: 38.1	6065
Evaluator: D. Mitchell, M. Rockwell	County:		Longitude: -77	7.456044
<b>Total Points:</b> 36.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determ Ephemeral Into	ination (circle one) ermitten Perennial	Other e.g. Quad Name:	:
A. Geomorphology (Subtotal = 15)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	4	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel  a artificial ditches are not rated; see discussions in manual	N	0 = 0	Yes	= 3)
B. Hydrology (Subtotal = 10)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1)	2	3
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5	Õ	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?		0 = 0	Yes	
C. Biology (Subtotal = <u>11.5</u> )				
18. Fibrous roots in streambed	3	$\bigcirc$	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	7	<u> </u>	3
21. Aquatic Mollusks	0	1	<del>-</del>	3
22. Fish	0	0.5	$\overline{\bigcirc}$	1.5
23. Crayfish	0	0.5	$\overline{C1}$	1.5
24. Amphibians	0	0.5	$\rightarrow$	1.5
25. Algae	0	0.5	$\overline{}$	1.5
26. Wetland plants in streambed			BL = 1.5 Other = 0	
*perennial streams may also be identified using other metho	ds. See p. 35 of manu			
Notes: Field Sheet 10-STR-03.		100 / 200		
	A	3		
		2		
Sketch:	Jet land	18		
}-	Je I WWW	1 = 1		
	1	8		
21/18	(a	a bor re R		
-311	g	17		
V	wetland			
	Wettand	Culver	f -	
	4	conver	1	

						nels classified as	fied Stream N n wadeable chan				
	Impact Factor	Impact/SAR length	SAR#	Date	HUC	Cowardin Class.	Locality	1	Project Name	I	Project #
				8/9/2016	02080105	R2SB	VA		RVA - Segme		N/A
				R-29b	03-ST	tion	e and Informa	Stream Name		e(s) of Evaluat Jering, R. F	
								on of the stream a	ss the cross-section	ondition: Asses	. Channel C
	ere	Sev	oor	Ро	y ginal	Conditional Categor Mar	ptimal	Subo	mal	Opti	
	5	1		1	5	1	~	17	MAN AND AND AND AND AND AND AND AND AND A	-	
CI	stability. Severe tained within the d below average ajority of banks agetative protection n 20% of banks, is on. Obvious bank Erosion/raw banks o/OR Aggrading nan 80% of stream by deposition, etability. Multiple d/or subterranean	Deeply incised vertical/lateral in incision, flow con banks. Streambe rooting depth, reventical/undercut. V present on less tha not preventing eros sloughing present. on 80-109%. ANI channel. Greater the bed is covered contributing to in thread channels ar flo	unstable. Likely to ority of both banks osion present on 60- getative protection & of banks, and is nt erosion. AND/OR eam is covered by Sediment is ent in nature, and ability. AND/OR V- thave vegetative nt on > 40% of the diment deposition is	are near vertical. En 80% of banks. Vet present on 20-409 insufficient to prevet 60-80% of the stre sediment. S temporary/transic contributing to inste shaped channels protection is presen	stable than Severe wer bank slopes. sesent on 40-60% of ive protection on 40-treambanks may rout. AND/OR 40-wered by sediment. emporary/transient, ty. Deposition that ability, may be NND/OR V-shaped stative protection on s and depositional	or Poor due to lo Erosion may be pr both banks. Negetal 60% of banks. S bevertical or unde 60% of stream is co Sediment may be t contribute instabili contribute to st forming/present. / channels have vege	ew areas of active ted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow fliend. Stream likely nkfull benches, or floodplains along reach. Transient 0-40% of the stream tom.	erosion or unproted of banks are st Vegetative protect prominent (60-Depositional feat stability. The bar channels are well de has access to bar newly developed portions of the r sediment covers 10 sedim	Vegetative surface Il rock, prominent OR Stable point ches are present, ginal floodplain or be bankfull benches, and transverse bars liment deposition	Very little incision or 100% stable banks. protection or nature (80-100%). AND. bars/bankfull benc Access to their orig fully developed wide Mid-channel bars, a few. Transient sec covers less than	Channel Condition
2.4		1	.6	1.	2	2	.4	2		3	Score
	s located	NOTES>> A driveway i		f length & width ma	measurements of	gory	areas along the en	Con			. RIPARIAN
		within the ri			•		Pillia	Subo	mai	Opti	
	ands and prest are within the	buffer. Wetl hardwood fo also present riparian buff	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	3 inches) present, nopy cover and a erstory. Wetlands	Tree stratum (dbh > 60% tree canon-maintained und located within the	Riparian Buffers
	ands and prest are within the	buffer. Wetl hardwood fo also presen	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	3 inches) present, nopy cover <mark>and a erstory.</mark> Wetlands e riparian areas.	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	Buffers
	ands and prest are within the	buffer. Wetl hardwood fo also presen	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to 6 % R	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  egories and Condith and width. Calc	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cower and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate	3 inches) present, nopy cover and a erstory. Wetlands or riparian areas.	Tree stratum (dbh > with > 60% tree ca	Condition Scores  Delineate ripar
	ands and prest are within the	buffer. Wetl hardwood fo also presen	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to 6 % R	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  egories and Condith and width. Calc	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cower and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate	3 inches) present, nopy cover and a erstory. Wetlands or riparian areas.	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	Condition Scores  Delineate ripar  Determine squ
	ands and prest are within the er.	buffer. Wetl hardwood fo also presen riparian buff	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  the sums  Liparian  qual 100	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to 6 % R	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  egories and Condith and width. Calc	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cower and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate	3 inches) present, nopy cover and a erstory. Wetlands or riparian areas.  5  ach stream bank inch by measuring core for each riparian areas.	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	Condition Scores  Delineate ripar
CI	ands and prest are within the er.	buffer. Wetl hardwood fo also presen	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  the sums  Liparian  qual 100	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to 6 % R	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  egories and Condith and width. Calc	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cower and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate	3 inches) present, nopy cover and a erstory. Wetlands e riparian areas.  5 ach stream bank inch by measuring core for each riparian areas.	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	Condition Scores  Delineate ripar Determine squ Enter the % Ri
CI 1.35	ands and orest are t within the er.	buffer. Wetl hardwood for also present riparian buff Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl >	Impervious surfaces, mine spoil lands, denuded surfaces, con crops, active feed lots, trails, or other comparable conditions.  Low  0.5  the sums  tiparian  qual 100  100%	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to f % R  Blocks en	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Cond th and width. Calc the blocks below.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate	3 inches) present, nopy cover and a erstory. Wetlands e riparian areas.  5 ach stream bank i ch by measuring core for each riparation 1.2  100% 1.2	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	Condition Scores  Delineate ripar Determine squ Enter the % Ri Right Bank
	ands and prest are to within the er.	buffer. Wetl hardwood for also present riparian buff Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl >	Impervious surfaces, mine spoil lands, denuded surfaces, con crops, active feed lots, trails, or other comparable conditions.  Low  0.5  the sums  tiparian  qual 100  100%	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to 6 % R	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Cond th and width. Calc the blocks below.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate	3 inches) present, nopy cover and a erstory. Wetlands e riparian areas.  5 ach stream bank i ch by measuring core for each riparation 1.2  100% 1.2  100% 1.5 ied substrate size	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	Condition Scores  Delineate ripar Determine squ Enter the % Ri Right Bank  Left Bank INSTREAM
	ands and prest are to within the er.	buffer. Wetl hardwood for also present riparian buff Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl >	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums tiparian qual 100 100%	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to discovere the blocks en bloc	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water, if present, tree stratum (dbh >3 inches) present, if present, tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	High Marginal: Non-maintained, dense herbaceous vegetation with > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Cond th and width. Calc the blocks below.  and depths; woody  Conditiona	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Into Condition Cate	3 inches) present, nopy cover and a erstory. Wetlands eriparian areas.  5  ach stream bank inch stream bank inch stream bank inch stream bank inch by measuring core for each riparian areas.  100% 1.2  100% 1.5  ied substrate size omplexes, stable	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	Condition Scores  Delineate ripar Determine squ Enter the % Ri Right Bank  Left Bank INSTREAM
	ands and prest are to within the er.	buffer. Wetl hardwood for also present riparian buff Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl >	Impervious surfaces, mine spoil lands, denuded surfaces, cover consumer surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  the sums  tiparian  qual 100  100%  100%	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the discovery of the condition of the condition of the condition of the comparable condition.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	High Marginal: Non-maintained, dense herbaceous vegetation with > 3 inches) present, with <30% tree canopy cover.  High  0.85  dition Scores using culators are provid	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Conditional th and width. Calc the blocks below.  Conditional ptimal ments are typically of the reach and are maintenance of	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate or estimating lenguarian category in the categor	3 inches) present, nopy cover and a erstory. Wetlands in riparian areas.  5  ach stream bank in the stream b	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	Condition Scores  Delineate ripar Determine squ Enter the % Ri Right Bank  Left Bank

	Si	tream In	npact A	ssessm	ent For	m Page	2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2SB	02080105	8/9/2016	03-STR-29b	500	1	•
4. CHANNEL spoil piles, constr	ALTERATION: Stream crossin ictions, livestock	igs, riprap, concre			ightening of chann	nel, channelization	n, embankments,	NOTES>>		
	Negligible	Mir	Conditiona nor		erate	Se	vere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	Greater than 80% by any of the chan in the parameter 80% of banks si	of reach is disrupted inel alterations listed guidelines AND/OR nored with gabion, or cement.			
SCORE	1.5	1.3	1.1	recovered.	recovered.	0	).5			1.30
0001112		CONDITION I								
NOTE: The Cls and R	CI should be rounded to 2 decimal places. Th			TREAM OUT	ADITION ON			CONDITION IN	IDEX (RCI) >>	1.25
nore. The die and it	0. 0.100.11 p. 100.1100 to 2 document process 11	io ore orionia po rouna.	ou to a whole hamber.					= (Sum of all C		1.20
							COMPENSAT	ION REQUIRE	MENT (CR) >>	0
							CR = RCI	X LF X IF		
DESCRIBE P	ROPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11

08/09/2016

Project/Site: DC2RVA - Area 03

Latitude: 38.159889

Date: 08/09/2016	Project/Site: DC2RVA - Area 03	Latitude: 38.159889
Evaluator: L. Eggering, R. Porath	County: Caroline	Longitude: -77.455927
Total Points: 40 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 18.5)	Absent	Weak	Moderate	Strong
a. Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
B. In-channel structure: ex. riffle-pool, step-pool,	0	<u> </u>	2	
ripple-pool sequence	U	<u> </u>		3
I. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0		2	3
7. Recent alluvial deposits	0	1	2	3
B. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
0. Natural valley	0	0.5	1	1.5
Second or greater order channel	No	0 = 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual				
3. Hydrology (Subtotal = 10.0 )				T
2. Presence of Baseflow	0	1	2	3
3. Iron oxidizing bacteria	0	1	2	3
4. Leaf litter	1.5	1	0.5	0
5. Sediment on plants or debris	0	0.5	1	1.5
6. Organic debris lines or piles	0	0.5	1	1.5
7. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 11.5)				
8. Fibrous roots in streambed	3	2	1	0
9. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75,	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other metho	ds. See p. 35 of manua	l.		
Notes: Field Sheet: 10- STR-01.				
Notes: Fleid Sneet: 10- STR-01.				
Sketch:				
oneich.				

			Unif	fied Stream M	ethodology f	or use in Virg		··· · <i>,</i>		
Project #	Project		or use in	wadeable channel	Cowardin	HUC	perennial Date	SAR#	Impact/SAR	Impact
N/A	DC2RVA			VA	Class. R2	02080105	12/1/2015		length	Factor
	e(s) of Evaluator(s)		m Nam	e and Informa		02080103	12/1/2013			
	chell, M. Rockwell					03-S	ΓR-30			
. Channel C	condition: Assess the cr	ss-section of the	ne stream	and prevailing co	ondition (erosion,					
	Optimal				onditional Categor		Po	or	Say	/ere
	Optimal		June 1	L S	A		4	<u> </u>		5
Channel Condition	Very little incision or active erc 100% stable banks. Vege surface protection or natura prominent (80-100%). MI Stable point bars/bankfull bi are present. Access to their floodplain or fully develope bankfull benches. Mid-chanr and transverse bars few. Tr sediment deposition covers le 10% of bottom.	sion; 80- tative rock, //OR roches riginal wide el bars, rischton	or unprotect anks are stative protect minent (60-sitional feat y. The ban els are well as access to y developerons of the r	ew areas of active ted banks. Majority table (60-80%). iion or natural rock 80%) AND/OR ures contribute to ikfull and low flow I defined. Stream o bankfull benches, of floodplains along each. Transient s 10-40% of the bottom.	or Poor due to lo Erosion may be prioth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sec temporary/trans instability. Depositic stability, may be AND/OR V-shapv vegetative protective	stable than Severe wer bank slopes. sesent on 40-60% of ative protection on Streambanks may rcut. AND/OR 40-1 is covered by liiment may be sient, contribute on that contribute to	Overwiden Vertically/laterally widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/Ol stream is cover Sediment is temp nature, and contri AND/OR V-shape vegetative protecti 40% of the bar sediment depos	unstable. Likely to ority of both banks rorsoin present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ad by sediment. orary/transient in outing to instability. ad channels have on is present on > hks and stable	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present to banks, is not pre Obvious bank sl. Erosion/raw bar AND/OR Aggradin	cut. Vegetative on less than 20% of eventing erosion. oughing present. aks on 80-100%. g channel. Greater n bed is covered by
Score	3		2	.4	contribute		1.		Multiple thread subterran	nean flow.
NOTES>>		l .			Field Sheet	40 CTD 02			I	
lar	Ontinul			ditional Categ		-11			NOTES>>	
Riparian Buffers	Optimal  Tree stratum (dbh > 3 inches) with > 60% tree canopy cove non-maintained understory. V located within the riparlan a	Riparis with tre (dbh > present, and a to 66 etalands eas. shrub la non-m unde	suboptimal: an areas e stratum 3 inches) , with 30% % tree cover and ning both eous and ayers or a aintained erstory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal:  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. It present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		weith tree ver. Starts
			igh	Low	High	Low	High			
Condition	4.5			4.4	0.05		0.0	Low		
Scores  Delineate ripa escriptors. Determine squelow.	1.5 arian areas along each stre uare footage for each by m Riparian Area and Score for % Riparian Area> 100	m bank into Co easuring or esti each riparian c	mating le	ngth and width. C	Calculators are pro	0.75	0.6  Ensure to of % R  Blocks en	0.5 he sums		
Scores  Delineate ripa escriptors. Determine sq elow. Enter the % F	arian areas along each stre quare footage for each by m Riparian Area and Score for	m bank into Co easuring or esti each riparian c	ondition C	ategories and Co	ndition Scores us	0.75	Ensure to	0.5 he sums iparian qual 100	Cl= (Sum % RA * S	cores*0.01\/2
Scores  Delineate ripa escriptors. Determine sq elow. Enter the % R  Right Bank	arian areas along each stre uuare footage for each by m Riparian Area and Score for % Riparian Area> 100	m bank into Co easuring or esti each riparian c	ondition C	ategories and Co	ndition Scores us	0.75	Ensure to	0.5 he sums iparian qual 100	C⊫ (Sum % RA * S Rt Bank Cl >	cores*0.01)/2
Delineate ripa escriptors. Determine sq elow. Enter the % F	arian areas along each stre uuare footage for each by m Riparian Area and Score for % Riparian Area> 100 Score > 1.	m bank into Co easuring or esti each riparian c	ondition C	ategories and Co	ndition Scores us	0.75	Ensure to	0.5 he sums iparian qual 100 100%		
Delineate ripa escriptors. Determine sq elow. Enter the % F Right Bank Left Bank	arian areas along each stre uuare footage for each by m Riparian Area and Score for % Riparian Area> 100 Score > 1.  % Riparian Area> 100 Score > 1.  W HABITAT: Varied subs	m bank into Co easuring or esti each riparian o	mating lea	ategories and Co ngth and width. Con the blocks below	ndition Scores us	0.75 ing the povided for you	Ensure to	0.5 he sums iparian qual 100 100%	Rt Bank CI >	1.10
Scores  Delineate ripa escriptors. Determine sq elow. Enter the % Right Bank  Left Bank  INSTREAM indercut banks;	arian areas along each stre quare footage for each by m Riparian Area and Score for % Riparian Area> 100 Score > 1.  % Riparian Area> 100 Score > 1.  M HABITAT: Varied sub- root mats; SAV; riffle poole	m bank into Co easuring or esti each riparian o	mating leterategory in	y and depths; wores.	ndition Scores us calculators are pro d.  ody and leafy deb	0.75 ing the povided for you pris; stable substr	Ensure to of % R Blocks en	0.5 he sums iparian qual 100 100% 100%	Rt Bank CI >	1.10
Scores Delineate ripa escriptors. Determine sq elow. Enter the % F Right Bank  Left Bank  INSTREAM ndercut banks; Instream Habitat/	arian areas along each stre uuare footage for each by m Riparian Area and Score for % Riparian Area> 100 Score > 1.  % Riparian Area> 100 Score > 1.  W HABITAT: Varied subs	m bank into Copassuring or estimate of the complexes, was complexes, sta	mating leterategory in	ategories and Congth and width. Con the blocks below	ndition Scores us calculators are pro d.  body and leafy deb	0.75 ing the povided for you ris; stable substr	Ensure to	0.5 he sums iparian qual 100 100% 100%	Rt Bank CI >	1.10
Delineate ripa escriptors. Determine sq elow. Enter the % F Right Bank Left Bank . INSTREAM ndercut banks;	arian areas along each stre quare footage for each by m Riparian Area and Score for % Riparian Area> 100 Score > 1.  % Riparian Area> 100 Score > 1.  M HABITAT: Varied sub- root mats; SAV; riffle poole	m bank into Copasuring or estimate in the complexes, stable present present in the complexes of the complexe	mating leader velocities the suboles of the suboles	y and depths; wores.	ndition Scores us calculators are pro .  ody and leafy deb I Category Mary Stable habitat eler	0.75  ing the  pvided for you   ris; stable substruction  ginal  ments are typically  of the reach and	Ensure to of % R Blocks en	0.5 he sums iparian qual 100 100% 100%  Iness; shade;	Rt Bank CI > Lt Bank CI > NOTES>>	1.10

	St	ream In	npact A	ssessm	ent For	m Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	csx		VA	R2	02080105	12/1/2015	03-STR-30			
4. CHANNEL	L ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of ch	nannel, channeliz	ation,	NOTES>>		
embankments, s	poil piles, constrictions, livestock		Conditiona					Culvert		
	Negligible	Mi	nor		erate	Sev	rere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with ga cem	y of the channel in the parameter OR 80% of banks bion, riprap, or			CI
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5			1.50
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			
NOTE: The CIs and R	RCI should be rounded to 2 decimal places. T	The CR should be roun	nded to a whole numb	er.				CONDITION IN		
								I= (Sum of all C		0
								I X LF X IF	MEITT (OIL) >>	
INSERT PHO	OTOS:									
DESCRIBE F	PROPOSED IMPACT:									

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

03-STR-30

Latitude: 38.157303

FACW = 0.75; OBL = 1.5 Other = 0

Evaluator: D. Mitchell, M. Rockwell	County: Spotsy	vlvania	Longitude: -77	.453181
<b>Total Points:</b> 37.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one ermitten Perennia		
A. Geomorphology (Subtotal = 16)	Absent	Weak	Moderate	Strong
1 <sup>a</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	4	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	N	o = 0	Yes:	= 3 )
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 9.5				
12. Presence of Baseflow	0	1_	2	<b>(</b> 3 <b>)</b>
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	(C)	1.5
17. Soil-based evidence of high water table?	N	o = 0	Yes :	= 3
C. Biology (Subtotal = 12 )				
18. Fibrous roots in streambed	(3)	2	1_	0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	0	1	8	3
21. Aquatic Mollusks	0	1	<b>2</b>	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1)	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5

Sketch:

26. Wetland plants in streambed

Notes: Field Sheet 10-STR-02.

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Date: 12/1/2015

Stream

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Cowardin **Impact** Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 03b R6 02080104 06/21/2016 VA 1 Name(s) of Evaluator(s) Stream Name and Information L. Eggering, R. Mangum 03-STR-B-01 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable NOTES>>Near culvert. Conditional Category Optimal Suboptimal Marginal Poor the vegetation is less Low Marginal: Non-maintained, optimal - taller High Poor: ow Suboptima trees/canopy west of ligh Suboptima Lawns, mowed Riparian areas with tree stratum (dbh > 3 inches) High Marginal: ense herbaceou Riparian areas with tree stratum (dbh > 3 inches) and maintained Low Poor: tracks. 21-STR-01 vegetation, riparian areas areas, nurseries no-till cropland; Impervious surfaces, mine vegetation with present, with acking shrub and resent, with 30% to 60% tree anopy cover and actively grazed pasture, sparsely vegetated non-Free stratum (dbh > 3 inches) presen spoil lands. Riparian 30% tree canop either a shrub tree stratum, hav with > 60% tree canopy cover and arnon-maintained understory. Wetland nuded surface layer or a tree layer (dbh > 3 roduction, ponds open water. If Buffers maintained maintained area eed lots, trails, or areas. containing both understory inches) present. present, tree herbaceous and shrub layers or a recently seeded ther comparable Recent cutove (dense vegetation). with <30% tree stratum (dbh >3 and stabilized, o conditions inches) present, with <30% tree canopy cover. non-maintained understory condition. anopy cover with maintained High Low High High Low Low Condition 1.2 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums escriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian elow. 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank CI= (Sum % RA \* Scores\*0.01)/2 100% 100% Rt Bank CI > CI % Riparian Area> 1.10

CR = RCI X LF X IF

Lt Bank CI >

THE REACH CONDITION INDEX (RCI) >>

RCI= (Riparian CI)/2
COMPENSATION REQUIREMENT (CR) >>

1.10

1.10

0.55

0



REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

Left Bank

Score >

1.1

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 06/21/2016

03-STR-B-01

Latitude: 38.308798

Evaluator: L. Eggering, R. Mangum	County: Stafford	d	Longitude: 38.	308798
<b>Total Points:</b> 8 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 4.5)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes :	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $0.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes :	= 3
C. Biology (Subtotal = 3				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	
*perennial streams may also be identified using other method	ds. See p. 35 of manua	ıl.		
Notes: Field Sheet: 21STR1.				
Sketch:	+ colv	evt evt		
	48"	well to R	KTVACKS	

					or use in Virg						
	Impact	Impact/SAR	SAR#	perennial Date	HUC	nels classified as Cowardin	n wadeable chan		Project Name		Project #
	Factor	length	JAK#			Class.	-				•
				06/21/2016	02080104	R2SB3	VA e and Informa		22RVA - Area	e(s) of Evalua	N/A Name
				R-B-02	03-STI		o ana miorina	Our Guilli Hallin		ering, R. M	
					gradation)	dition (erosion, agg	and prevailing cond	on of the stream a	ess the cross-secti	ondition: Asse	. Channel C
	ere	Seve	or	Po	ginal	Conditional Categor	ptimal	Subo	timal	Opt	
	5		adding and	Overwiden	5	Often incised, but I	1	1	ar Jan	1	
CI	tability. Severe ained within the d below average ajority of banks getative protection 20% of banks, is on. Obvious bank Erosion/raw banks (VOR Aggrading an 80% of stream by deposition, tability. Multiple d/or subterranean	Deeply incised (c vertical/lateral inst incision, flow contbanks. Streamber rooting depth, me vertical/undercut. Ve present on less than not preventing erosic sloughing present. E on 80-100%. AND channel. Greater the bed is covered tontributing to inst thread channels and flow	unstable. Likely to iority of both banks osion present on 60- getative protection & of banks, and is nt erosion. AND/OR eam is covered by Sediment is and baility. AND/OR V- thave vegetative nt on > 40% of the diment deposition is	Vertically/laterally widen further. Maj are near vertical. Er 80% of banks. Ver present on 20-40% insufficient to prever 60-80% of the stre sediment. Stemporary/transie contributing to instate.	stable than Severe wer bank slopes.  sesent on 40-60% of  ive protection on 40- treambanks may  rout. AND/OR 40- vered by sediment.  emporary/transient,  ty. Deposition that  ability, may be  ND/OR V-shaped  the protection on  s and depositional	Poor. Banks more or Poor due to lo Erosion may be pre both banks. Vegetat 60% of banks. S bevertical or under 60% of stream is cc Sediment may be t contribute instabilist contribute to st forming/present. A	ew areas of active cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow efined. Stream likely nkfull benches, or floodplains along reach. Transient 0-40% of the stream tom.	erosion or unproted of banks are sit Vegetative protect prominent (60-Depositional feat stability. The bar channels are well de has access to ba newly developed portions of the 1 sediment covers 10	or active erosion; 80- . Vegetative surface arl rock, prominent D/OR Stable point nches are present. riginal floodplain or de bankfull benches. and transverse bars diment deposition n 10% of bottom.	100% stable banks. protection or natur (80-100%). AND bars/bankfull ber Access to their or fully developed wid Mid-channel bars, few. Transient se	Channel Condition
2.0		1	.6	1.	2	2	.4	2	3	;	Score
		NOTES>>		f length & width ma	measurements of	gory	areas along the en	Con	Assess both bank's		. RIPARIAN
			101	High Poor: Lawns,	Low Marginal:	Iviai	pulliai	3000	umai	Орі	
			Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present,	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a	> 3 inches) present, anopy cover and a iderstory. Wetlands he riparian areas.	with > 60% tree conon-maintained un	Riparian Buffers
			conditions.	comparable condition.	with <30% tree canopy cover with maintained understory.	tree canopy cover.	vegetation).	non-maintained understory.			
			conditions.	comparable condition.	with <30% tree canopy cover with maintained understory.	High	vegetation).	non-maintained understory.			Condition
			conditions.	comparable condition.	with <30% tree canopy cover with maintained understory.		vegetation).	non-maintained understory.	.5	1	Condition Scores
			Low 0.5 the sums tiparian qual 100	comparable condition.  High  0.6  Ensure the of % R	with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High 0.85	Low 1.1 egories and Conduth and width. Calc	High 1.2 into Condition Cate or estimating leng	each stream bank ach by measuring Score for each ripa	rian areas along e uare footage for eciparian Area and s	Scores  Delineate ripa Determine squ
			Low 0.5 the sums	comparable condition.  High  0.6  Ensure the of % R	with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High 0.85	Low 1.1 egories and Conduth and width. Calc	High 1.2 into Condition Cator estimating lenguarian category in the 20%	each stream bank ach by measuring Score for each rips 80%	rian areas along e uare footage for ed iparian Area and a % Riparian Area>	Scores  Delineate ripa Determine squ
	ores*0.01)/2	CI= (Sum % RA * Soc	Low 0.5 the sums tiparian qual 100 100%	comparable condition.  High  0.6  Ensure the of % R	with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High 0.85	Low 1.1 egories and Conduth and width. Calc	High 1.2 into Condition Cate or estimating leng	each stream bank ach by measuring Score for each ripa	rian areas along e uare footage for ec iparian Area and	Scores  Delineate ripa Determine squ Enter the % R
Cl	0.72	Rt Bank CI >	Low 0.5 the sums tiparian qual 100 100%	comparable condition.  High  0.6  Ensure the of % R	with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High 0.85	Low 1.1 egories and Conduth and width. Calc	High 1.2 into Condition Cator estimating lenguarian category in the 20%	each stream bank ach by measuring Score for each rips 80% 0.6	rian areas along e uare footage for e iparian Area and :  % Riparian Area>  Score >	Scores  Delineate ripa Determine squ Enter the % R
CI 0.96		Rt Bank CI >	Low 0.5 the sums tiparian qual 100 100%	comparable condition.  High  0.6  Ensure the of % R  Blocks en	with <30% free canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	High 0.85  ition Scores using culators are provided and leafy debris;	Low  1.1  egories and Cond th and width. Calc he blocks below.  and depths; woody	non-maintained understory.  High 1.2  into Condition Cate or estimating lenguarian category in the 20% 1.2  es, water velocity as	each stream bank ach by measuring Score for each rips 80% 0.6	rian areas along e uare footage for ec iparian Area and :  % Riparian Area> Score >  % Riparian Area> Score >  1 HABITAT: Va	Scores  Delineate ripa Determine squ Enter the % R Right Bank Left Bank
	0.72	Rt Bank CI >	Low 0.5 the sums qual 100 100%	comparable condition.  High  0.6  Ensure the of % R Blocks en	with <30% free canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	High 0.85  ition Scores using culators are provided and leafy debris; all Category	Low  1.1  egories and Cond th and width. Calc he blocks below.  and depths; woody	non-maintained understory.  High 1.2  Into Condition Cate or estimating lenguarian category in the 20% 1.2  es, water velocity as features.	ach stream bank ach by measuring Score for each rips 80% 0.6 100% 1.2 aried substrate size	rian areas along e uare footage for ei iparian Area and : % Riparian Area> Score >  % Riparian Area> Score >  1 HABITAT: Va ; SAV; riffle poole	Scores  Delineate ripa Determine squ Enter the % R Right Bank  Left Bank  INSTREAN Anks; root mats
	0.72	Rt Bank CI >	Low 0.5  the sums tiparian qual 100 100%  100%  shade; undercut toor	comparable condition.  High  0.6  Ensure the of % R  Blocks en  Blocks en  Habitat elements lacking or are un	with <30% free canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.  stable substrate; I	High 0.85  ition Scores using culators are provided and leafy debris; al Category Mary Stable habitat eler	Low 1.1 egories and Cond th and width. Calc he blocks below.  and depths; woody Conditiona	non-maintained understory.  High 1.2  into Condition Cate or estimating lenguarian category in the 20% 1.2  Subo Stable habitat elepresent in 30-50% adequate for radical category in the category in the 20% and category in	each stream bank ach by measuring Score for each rips 80% 0.6 100% 1.2 aried substrate size complexes, stable	rian areas along e uare footage for exiparian Area and 3 % Riparian Area > Score >  % Riparian Area> Score >  1 HABITAT: Va SAV; riffle poole Opt Habitat elements a	Scores  Delineate ripa Determine squ Enter the % R Right Bank Left Bank

	Si	tream In	npact A	ssessm	ent For	m Page	2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2SB3	02080104	06/21/2016	03-STR-B02	500	1	ľ
4. CHANNEL spoil piles, constri	ALTERATION: Stream crossin ictions, livestock	igs, riprap, concret			ghtening of chann	nel, channelization	, embankments,	NOTES>>Tw present. 1		
	March 19. 1			al Category		0		near the tra	cks, 1 is	
-	Negligible	Mir	nor	40 - 60% of reach	erate 60 - 80% of reach	Sev	vere	located ups	tream near	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel		by any of the chang in the parameter of	of reach is disrupted nel alterations listed guidelines AND/OR lored with gabion,	an outfall w	ith rip-rap.	
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			1.10
	REACH (	CONDITION I	NDEX and S	TREAM CON	IDITION UNI	TS FOR THIS	S REACH			
IOTE: The CIs and RO	CI should be rounded to 2 decimal places. Th	ne CR should be rounde	ed to a whole number.				THE REACH	CONDITION IN	DEX (RCI) >>	1.05
							RC	= (Sum of all C	l's)/5	
							COMPENSAT	ION REQUIRE		0

INSERT PHOTOS:



Top Left: Typical view of stream near data point Top Right: Typical view upstream Bottom Left: Typical view downstream toward culvert under railroad

CR = RCI X LF X IF

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 06/21/2016

03-STR-B-02

Latitude: 38.305795

	1 Tojoodono. Doz			
Evaluator: L. Eggering, R. Mangum	County: Stafford		Longitude: -77	.441144
Total Points: 43.5 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determir Ephemeral Inter			
A. Geomorphology (Subtotal = 26)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	0	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual  B. Hydrology (Subtotal = 10)				
12. Presence of Baseflow	0	1	2	3
	0	<u>'</u> 1	2	3
13. Iron oxidizing bacteria 14. Leaf litter	1.5	<u> </u>	0.5	0
15. Sediment on plants or debris	0	0.5		1.5
16. Organic debris lines or piles	Ö	0.5	1 1	1.5
17. Soil-based evidence of high water table?		= 0	Yes:	
C. Biology (Subtotal = $\frac{7.5}{}$ )	140		103	
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)		1	2	3
21. Aquatic Mollusks		<u>'</u> 1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	Ö	0.5	1	1.5
26. Wetland plants in streambed	$+$ $\odot$ $+$		OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method	do Coop 25 of manual		OBL = 1.5 Other = 0	
Notes: Corrugated metal pipe 60" diameter. Field		•		
votes. Con agaica metar pipe co diameter. Field	Oncot. 21 OTT.2.			
Sketch:	Year Choose	Seve Vide	ver beig	

		Stre	Uni	fied Stream N	lethodology f	or use in Virg		n 1)			
Project #		Project Name		n wadeable chan	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area	03b	VA	02SB4	02080104	06/21/2016				
	e(s) of Evalua	•	Stream Name	e and Informa	tion	02 ST	R-B-03				
	gering, R. M.	_	on of the atroom o	and provoiling con	dition (oronion, ag		K-D-03				
i. Chamilei C				(	Conditional Categor	у					
	Opt.	imal W	3400	ptimal	Often incised, but	ess than Severe or stable than Severe	Overwiden Vertically/laterally	ed/incised.	Sev	5	
Channel Condition	100% stable banks. protection or natur (80-100%). AND bars/bankfull ber Access to their or fully developed wid Mid-channel bars, few. Transient se	or active erosion; 80- Vegetative surface al rock, prominent I/OR Stable point ches are present. Iginal floodplain or le bankfull benches. and transverse bars diment deposition in 10% of bottom.	erosion or unproted of banks are s Vegetative protec prominent (60-Depositional feat stability. The banchannels are well dhas access to banewly developed portions of the sediment covers 11	ew areas of active tede banks. Majority table (60-80%). Ition or natural rock -80%) AND/OR rures contribute to nkfull and low flow effined. Stream likely nkfull benches, or floodplains along reach. Transient 0-40% of the stream tom.	or Poor due to lo Erosion may be pr both banks. Vegeta 60% of banks. S bevertical or unde 60% of stream is co Sediment may be to contribute to s forming/present. / channels have vege	wer bank slopes. sesent on 40-60% of ive protection on 40 treambanks may rout. AND/OR 40-overed by sediment. emporary/transient, ty. Deposition that ability, may be NND/OR V-shaped betative protection on s and depositional	widen further. Maj are near vertical. Er 80% of banks. Ve present on 20-40%	ority of both banks cosion present on 60- getative protection 60- getative protection 6 of banks, and is nt erosion. AND/OR tam is covered by sediment is muture, and libility. AND/OR V- have vegetative nt on > 40% of the diment deposition is	incision, flow con banks. Streambe rooting depth, m vertical/undercut. V present on less tha not preventing eros sloughing present. on 80-100%. ANI channel. Greater II bed is covered contributing to in- thread channels ar	stability. Severe tatained within the do below average ajority of banks egetative protection n 20% of banks, is ion. Obvious bank Erosion/raw banks 20/OR Aggrading han 80% of stream by deposition, stability. Multiple td/or subterranean	
Sooro		3	2	.4		2	1.	6	flo 1		C
Score	,	3		.4	<u>'</u>	2	1.	0			2.
Riparian Buffers	with > 60% tree c	> 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.		3 inches) present, with > 30% tree canopy cover and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (db. > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
			High	Low	High	Low	High	Low			
Condition	1	.5	1.2	1.1	0.85	0.75	0.6	0.5			
Scores			-						4		
Scores  1. Delineate ripa  2. Determine squ	arian areas along e uare footage for ea Riparian Area and S	ach by measuring	or estimating leng	th and width. Cale	•		Ensure t of % R Blocks e	iparian			
Scores  1. Delineate ripa 2. Determine squ 3. Enter the % R	uare footage for ea	ach by measuring	or estimating leng	th and width. Cale	•		of % R	iparian			
Scores  1. Delineate ripa  2. Determine squ	uare footage for ea	ach by measuring	or estimating leng	th and width. Cale	•		of % R	iparian qual 100	CL (Sup % DA * 2	2010 01\/Q	
Scores  Delineate ripa  Determine squ  Enter the % R  Right Bank	uare footage for ea	ach by measuring Score for each rips 100%	or estimating leng	th and width. Cale	•		of % R	iparian qual 100	CI= (Sum % RA * So Rt Bank CI >	cores*0.01)/2	С
Scores  Delineate ripa Determine squ BENETHE & R Right Bank Left Bank	ware footage for excitage and statement of the control of the cont	Score for each rips 100% 1.2 100% 1.2	or estimating leng	th and width. Caline blocks below.	culators are provid	ed for you below.	of % R Blocks e	iparian qual 100 100%	Rt Bank CI >	·	C 1.2
Scores  1. Delineate ripa 2. Determine squ 3. Enter the % R Right Bank  Left Bank 3. INSTREAN	ware footage for excitage and some source of the source of	Score for each rips 100% 1.2 100% 1.2 100% 1.2 ried substrate size	or estimating leng	th and width. Caline blocks below.	culators are provid	ed for you below.	of % R Blocks e	iparian qual 100 100%	Rt Bank CI >	1.20	
Scores  1. Delineate ripa 2. Determine squ 3. Enter the % R Right Bank  Left Bank  3. INSTREAN banks; root mats;	ware footage for exception of the control of the co	Score for each rip: 100% 1.2 100% 1.2 rried substrate siz: complexes, stable	or estimating leng arian category in the category h and width. Calc ne blocks below.	culators are provided to the culture of the culture	ed for you below.	of % R Blocks e	iparian qual 100 100% 100% shade; undercut	Rt Bank CI >	1.20		
Scores  1. Delineate ripa 2. Determine squ 3. Enter the % R Right Bank  Left Bank 3. INSTREAN	ware footage for exitiparian Area and \$ % Riparian Area and \$ % Riparian Area > Score >  % Riparian Area > Score >  M HABITAT: Va ; SAV; riffle poole  Opt  Habitat elements a	Score for each rips 100% 1.2 100% 1.2 100% 1.2 ried substrate size	arian category in the second s	th and width. Calche blocks below.	v and leafy debris; al Category Mar. Stable habitat ele present in 10-30%	stable substrate; ginal ments are typically of the reach and are	of % R Blocks e	iparian qual 100 100% 100% shade; undercut or listed above are stable. Habitat ally present in less	Rt Bank CI >	1.20	

	St	tream In	npact A	ssessm	ent For	m Page	2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	02SB4	02080104	06/21/2016	03-STR-B03	500	1
	ALTERATION: Stream crossin ictions, livestock	igs, riprap, concre		al Category	ightening of chanr	nel, channelization	, embankments,	NOTES>>Cu railroad cro	
	Negligible	Mir	nor		erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.		60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	by any of the chang in the parameter of	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH (	CONDITION	NDEX and S	TREAM CON	NDITION UNI	TS FOR THIS	S REACH		,

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.22

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF



Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 06/21/2016

03-STR-B-03

Latitude: 38.302511

Evaluator: L. Eggering, R. Mangum	County: Stafford	t	Longitude: -77	.441496
<b>Fotal Points:</b> 36.5 Stream is at least intermittent f ≥ 19 or perennial if ≥ 30*		nation (circle one rmittent Perenni		
	_			
A. Geomorphology (Subtotal = 18 )	Absent	Weak	Moderate	Strong
1a. Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	11	2	3
7. Recent alluvial deposits	0	1	2	3
3. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
0. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes =	= 3
artificial ditches are not rated; see discussions in manual  3. Hydrology (Subtotal = 9.5)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5		1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?		0 = 0	Yes =	
C. Biology (Subtotal = 9.0 )				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)		1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	(1)	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5		1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method	ds. See p. 35 of manua	l.		
	eld Sheet: 21STR3	A: ::	4 miles	

					or use in Virg	lethodology f	SSESS ified Stream M				
	Impact	Impact/SAR	SAR#	perennial Date	HUC	nels classified as Cowardin	n wadeable chan		Project Name		Project #
	Factor	length	JAN#			Class.	-		-		-
				06/21/2016	02080104	R2SB3	VA e and Informa		2RVA - Area (	e(s) of Evalua	N/A Name
				R-B-04	03-STF		o ana miorina	Otroum rum		ering, R. Ma	
						dition (erosion, agg	and prevailing cond	on of the stream a	ess the cross-section	ondition: Asse	. Channel C
	ere	Seve	or	Po	y ginal	Conditional Categor	ptimal	Subo	imal	Opt	
	5		adjusted a	Overwiden	5	Often incised, but I	1	1		1	
CI	tability. Severe ained within the d below average ajority of banks getative protection 20% of banks, is on. Obvious bank Erosion/raw banks (OR Aggrading an 80% of stream by deposition, tability. Multiple 4/or subterranean	Deeply incised ( vertical/lateral ins incision, flow cont banks. Streambee rooting depth, m vertical/undercut. Ve present on less thar not preventing erosi sloughing present. I on 80-100%. AND channel. Greater th bed is covered contributing to ins thread channels an	unstable. Likely to ority of both banks ossion present on 60-getative protection & of banks, and is nt erosion. AND/OR eam is covered by Sediment is ant in nature, and ability. AND/OR V-have vegetative nt on > 40% of the diment deposition is	Vertically/laterally widen further. Maj are near vertical. Er 80% of banks. Ver present on 20-40%	stable than Severe wer bank slopes. wer bank slopes. seent on 40-60% of ive protection on 40 irreambanks may rout. AND/OR 40-vered by sediment. emporary/transient, ty. Deposition that ability, may be ND/OR V-shaped tative protection on s and depositional	Poor. Banks more or Poor due to lo Erosion may be pre both banks. Vegetat 60% of banks. S bevertical or under 60% of stream is cc Sediment may be t contribute instabilist contribute to st forming/present. A	ew areas of active cted banks. Majority table (60-80%). titon or natural rock -80%) AND/OR tures contribute to nkfull and low flow efined. Stream likely nkfull benches, or 1floodplains along reach. Transient 0-40% of the stream tom.	erosion or unproted of banks are sit Vegetative protect prominent (60- Depositional feat stability. The bar channels are well du has access to ba newly developed portions of the re-	or active erosion; 80- Vegetative surface lal rock, prominent D/OR Stable point tches are present. iginal floodplain or te bankfull benches. and transverse bars diment deposition in 10% of bottom.	100% stable banks. protection or natur (80-100%). AND bars/bankfull ben Access to their ori fully developed wid Mid-channel bars, a few. Transient se	Channel Condition
2.0		1	.6	1.	2	2	.4	2	3	3	Score
		NOTES	ay be acceptable)	length & width ma	measurements of	. •	areas along the er	100 foot riparian	ssess both bank's	BUFFERS: A	. RIPARIAN
		NOTES>>	oor	Po High Poor: Lawns,			nditional Cate ptimal		imal	Opt	
		NOTES>>	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.						> 3 inches) present, anopy cover and a derstory. Wetlands	Tree stratum (dbh : with > 60% tree ca	Riparian Buffers
		NOTES>>	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Mary  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	> 3 inches) present, anopy cover and a derstory. Wetlands	Tree stratum (dbh: with > 60% tree canon-maintained un	Buffers
		NOTES>>	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cower and containing both herbaceous and shrub layers or a non-maintained understory.	> 3 inches) present, anopy cover and a derstory. Wetlands	Tree stratum (dbh: with > 60% tree conon-maintained un located within th	
		NOTES>>	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  egories and Conduth and width. Calculated and width.	High Suboptimal: Riparian areas with tree stratum (dbh 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate or estimating lengers	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the located within	Condition Scores  Delineate ripar
		NOTES>>	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  egories and Conduth and width. Calculated and width.	High Suboptimal: Riparian areas with tree stratum (dbh 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate or estimating lengers	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.	Tree stratum (dbh: with > 60% tree ci non-maintained un located within th  1. Tian areas along e tare footage for ea sparian Area and \$ % Riparian Area>	Condition Scores  Delineate ripar  Determine squ
	,	CI= (Sum % RA * Sc	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums ciparian qual 100 100%	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  egories and Conduth and width. Calculated and width.	High Suboptimal: Riparian areas with tree stratum (dbh 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate or estimating lengers	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  .5  ach stream bank if ach by measuring the stream bank if ach by measuring the stream bank if and by measuring the stream bank if ach by measuring the stream bank if a	Tree stratum (dbh: with > 60% tree ci non-maintained un located within th  1.  Tian areas along e parian Area and \$ % Riparian Area> Score >	Condition Scores  Delineate ripar  Determine squ
CI 120	1.20	CI≕ (Sum % RA * Sc Rt Bank CI >	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  egories and Conduth and width. Calculated and width.	High Suboptimal: Riparian areas with tree stratum (dbh 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate or estimating lengers	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  .5  .ach stream bank if ach by measuring the stream bank if a stream bank i	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1.  Tian areas along e pare footage for ea parian Area and \$ % Riparian Area> \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Condition Scores  Delineate ripar  Determine squ
CI 1.20	,	CI= (Sum % RA * So Rt Bank CI > Lt Bank CI >	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums tiparian qual 100 100%	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water, if present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  egories and Condition and width. Calculate the blocks below.	Subo  High Suboptimal: Riparian areas with tree stratum (dbh 30 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate or estimating lenguarian category in the season of the	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  .5  ach stream bank if ach by measuring the stream bank if ach by measuring the stream bank if and by measuring the stream bank if ach by measuring the stream bank if a	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1.  Tian areas along e pare footage for ea parian Area and S % Riparian Area> Score >  % Riparian Area> Score >  1 HABITAT: Va	Condition Scores  Delineate ripar Determine squ Enter the % Ri Right Bank  Left Bank  INSTREAM
	1.20	CI= (Sum % RA * So Rt Bank CI > Lt Bank CI >	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums tiparian qual 100 100%  100%	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Ition Scores using culators are provid	Low Suboptimal: Riparian areas with tree stratum (db. 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Conduct and width. Calculate the blocks below.	Subo  High Suboptimal: Riparian areas with tree stratum (db- 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate or estimating lenguarian category in the cat	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  -5	Tree stratum (dbh: with > 60% tree ci non-maintained un located within th  1.  Tian areas along e parian Area and \$ % Riparian Area> Score >  % Riparian Area> Score >  1 HABITAT: Va SAV; riffle poole o	Condition Scores  Delineate ripar Determine squ Enter the % Ri Right Bank  Left Bank INSTREAM
	1.20	CI= (Sum % RA * So Rt Bank CI > Lt Bank CI >	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums tiparian qual 100 100%  100%  standard trails tiparian qual trails tiparian qual trails tiparian qual libuta and trails tiparian qual libuta libuta and trails tra	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and steed and steed area, recently seeded and steed area, recentl	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water, if present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  stion Scores using culators are provide and leafy debris; al Category Marginal	Low Suboptimal: Riparian areas with tree stratum (dbh 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Conduth and width. Calcuth and depths; woody	Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate or estimating lenguarian category in the service of the service	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  .5  .5  .5  .5  .5  .5  .6  .6  .7  .7  .7  .7  .8  .8  .8  .9  .9  .9  .9  .9  .9  .9	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1.  rian areas along e pare footage for each parian Area and S % Riparian Area> Score >  % Riparian Area> Score >  1 HABITAT: Va SAV; riffle poole (d) Opt	Condition Scores  Delineate ripar Determine squ Enter the % Ri Right Bank  Left Bank  INSTREAM

	St	tream Ir	npact A	ssessm	ent For	m Page	2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB3	02080104	06/21/2016	03-STR-B04	500	1
	ALTERATION: Stream crossin rictions, livestock	igs, riprap, concre		ncrete blocks, strai	ightening of chanr	nel, channelization	, embankments,	NOTES>>2 c present.	ulverts
	Negligible	Mi	nor		erate	Se	vere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% by any of the chan in the parameter \$80% of banks sh	of reach is disrupted nel alterations listed guidelines AND/OR lored with gabion, r cement.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH (	CONDITION	NDEX and S	TREAM CON	NDITION UNI	TS FOR THI	S REACH		•
IOTE: The Cls and R	CI should be rounded to 2 decimal places. The	ne CR should be round	ed to a whole number.				THE REACH	CONDITION IN	DEX (RCI) >>

INSERT PHOTOS:

Top Left: Typical view upstream Bottom Right: Upstream toward culvert

RCI= (Sum of all Cl's)/5
COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF



NC DWO Stream Identification Form Version 4.11

03-STR-B-04

THE BY & Stream Identification I of	ii verbion iiii				
Date: 06/21/2016	Project/Site: DC2RVA - Area 03 Latitude: 38.299016				
Evaluator: L. Eggering, R. Mangum	County: Stafford	d	Longitude: -77	Longitude: -77.444890	
<b>Total Points:</b> 43 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial  Other e.g. Quad Name:			:	
A. Geomorphology (Subtotal = 26.5	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	1	2	3	
3. In-channel structure: ex. riffle-pool, step-pool.					

A. Geomorphology (Subtotal = 20.5	Absent	Weak	Woderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = 0		Yes = 3	
a artificial ditches are not rated; see discussions in manual	•			

B. Hydrology	(Subtotal = 7.0)
--------------	------------------

12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 9.5

	_			
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75: OBL = 1.5 Other = 0			

\*perennial streams may also be identified using other methods. See p. 35 of manual.

culvert 12

Notes: Culvert 12, 48" thick concrete pipe; Culvert 13, 36" corrugated metal pipe. Field Sheet: 21STR 4 Claiborne Run tributary.

Sketch:

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC SAR# Date Class. length Factor N/A DC2RVA - Area 03b ۷A R6 02080104 06/21/2016 1 Name(s) of Evaluator(s) Stream Name and Information L. Eggering, R. Mangum 03-STR-B-05 RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>>Right bank

			Tallo Tial Calo	94.7					g
	Optimal	Sub	optimal	Mar	ginal	Po	oor	near culver	t on steep
Riparian Buffers	Tree stratum (dbh > 3 inches) with > 60% tree canopy cover non-maintained understory. Wareas.	and an to 60% tree	with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and a maintained understory.	High Marginal: Non-maintained, dense herbaceous vegetation with	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparselly vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces row crops, active feed lots, trails, or other comparable conditions.	cover. 21-S	llast and ne for 5ft; left nse tree
		High	Low	High	Low	High	Low	1	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	1	
Delineate ripa	rian areas along each stream	m bank into Condition C	ategories and Con	dition Scores usir	ng the descriptors.	Ensure	the sums		
	uare footage for each by me	asuring or estimating le	ngth and width. Ca	alculators are pro	vided for you	of % F	Riparian		
pelow. 3 Enter the % R	Riparian Area and Score for	each rinarian category in	the blocks below				equal 100		
	% Riparian Area> 90%		D. D. CONO DOIOW.			Diocks (	100%		
Right Bank	Score > 0.5						13070		
								CI= (Sum % RA * S	Scores*0.01)/2
Left Bank	% Riparian Area> 100	%					100%	Rt Bank CI >	0.54
Leit Balik	Score > 1.2	2						Lt Bank CI >	1.20

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.44

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

INSERT PHOTOS:



REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

Top Left: Typical view of channel and surronding vegetaton

Top Right: Culvert associated with stream

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 06/22/2016

03-STR-B-05

Evaluator: L. Eggering, R. Mangum	County: Stafford		Longitude: -77.442616		
<b>Total Points:</b> 9 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	the state of the s		Other e.g. Quad Name:		
A. Geomorphology (Subtotal = $5.0$	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3	
Sinuosity of channel along thalweg	0	1	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits		1	2	3	
8. Headcuts	0	1)	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley		0.5	1	1.5	
11. Second or greater order channel		0 = 0	Yes:		
a artificial ditches are not rated; see discussions in manual  B. Hydrology (Subtotal = 2.0)					
12. Presence of Baseflow		4	2	3	
	0	1	2		
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
<ul><li>16. Organic debris lines or piles</li><li>17. Soil-based evidence of high water table?</li></ul>	0	0.5	1 Yes:	1.5	
	140	0 = 0	res :	= 3	
C. Biology (Subtotal = $2.0$ )		0		0	
18. Fibrous roots in streambed	3	2	$\frac{1}{2}$	0	
19. Rooted upland plants in streambed	3	2	<u> </u>	0	
20. Macrobenthos (note diversity and abundance)		1	2	3	
21. Aquatic Mollusks		1	2	3	
22. Fish		0.5 0.5	<u> </u>	1.5 1.5	
23. Crayfish					
24. Amphibians 25. Algae		0.5 0.5	1	1.5 1.5	
-					
<ul><li>26. Wetland plants in streambed</li><li>*perennial streams may also be identified using other metho</li></ul>	ide Soon 25 of manua	FACW = 0.75; OB	L = 1.5 Other = 0	, <u> </u>	
Notes: Ephemeral stream associated with Culver			21 STR5.		
Sketch:		culvart 20	T RR track	5	

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR **Impact** Project # **Project Name** Locality HUC Date SAR# Class length Factor DC2RVA - Area 03b 02080104 06/22/2016 N/A VΑ R6 1 Name(s) of Evaluator(s) **Stream Name and Information** 03-STR-B-06 L. Eggering, R. Mangum 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>>Close to Optimal Suboptimal Marginal Poor railroad tracks and ballast. Dense shrubs Low Marginal: ligh Poor: Lawns and herbaceous Non-maintained mowed, and High Suboptimal Low Suboptimal High Marginal: dense herhaceoi naintained areas Low Poor: Riparian areas with ree stratum (dbh : Rinarian areas wit growth; in woods, Non-maintained, dense herbaceous regetation, ripariar reas lacking shrut nurseries; no-till Impervious surfaces, mine ee stratum (dbh : canopy is more dense. cropland; actively 3 inches) present, with 30% to 60% 3 inches) present Tree stratum (dbh > 3 inches) present vegetation with and tree stratum grazed pasture. spoil lands. with >30% tree canopy cover and Riparian 21-STR-06 with > 60% tree canopy cover hay production parsely vegetate non-maintained uded surfaces, tree canopy cover **Buffers** non-maintained understory. Wetlands or a tree layer (dbh onds, open wate row crops, active and containing both herbaceous and shrub layers or a a maintained areas. > 3 inches) If present, tree area, recently feed lots, trails, or nderstory. Recei cutover (dense vegetation). stratum (dbh >3 inches) present, with <30% tree present, with <30% tree canopy cover. seeded and abilized, or othe other comparable conditions. non-maintained comparable understory canopy cover wit maintained condition. understory. High Low High Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below 80% 20% 100% % Riparian Area> Right Bank Score > 1.2 0.5 CI= (Sum % RA \* Scores\*0.01)/2 100% 100% Rt Bank CI > 1.06 CI % Riparian Area> Left Bank 1.2 Lt Bank CI > 1.20 1.13 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.57 NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number. RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF INSERT PHOTOS:



Left: Typical view upstream

Right: Typical view downstream

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 06/22/2016

03-STR-B-06

Evaluator: L. Eggering, R. Mangum	County: Stafford	b	Longitude: -77.438351	
Total Points: 7.5  Stream is at least intermittent f ≥ 19 or perennial if ≥ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	
) Coornambalani (O.11111 65	Abcent	Weak	Moderate	Ctrong
A. Geomorphology (Subtotal = 6.5	Absent			Strong
a. Continuity of channel bed and bank	0	0	2	3
2. Sinuosity of channel along thalweg 3. In-channel structure: ex. riffle-pool, step-pool,	0		2	3
ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
. Active/relict floodplain	0	(1)	2	3
5. Depositional bars or benches		1	2	3
. Recent alluvial deposits		1	2	3
B. Headcuts	0	1	2	3
D. Grade control		0.5	1	1.5
Natural valley	0	0.5	1	1.5
Second or greater order channel		0 = 0	Yes =	
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $0$				
2. Presence of Baseflow	0	1	2	3
Iron oxidizing bacteria		1	2	3
4. Leaf litter	1.5	1	0.5	Ö
Sediment on plants or debris	(i)	0.5	1	1.5
6. Organic debris lines or piles		0.5	1	1.5
7. Soil-based evidence of high water table?		0 = 0	Yes =	
C. Biology (Subtotal = 1 )				
8. Fibrous roots in streambed	3	2	1	0
Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)		1	2	3
21. Aquatic Mollusks		1	2	3
22. Fish		0.5	1	1.5
23. Crayfish		0.5	1	1.5
24. Amphibians		0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OBI	= 1.5 Other = 0	
*perennial streams may also be identified using other method	ls See n. 35 of manual		2 - 1.0 0 0 0 0 0	
Notes: Associated with Culvert 22; channel extend			TR6. culvert22.	
			-, <del></del>	
		100		
Sketch:  deep	mole			

		Stre					(Forr	n 1)			
				ified Stream N							1
Project #		Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	03b	VA	R2SB3	02080104	06/22/2016				
	ne(s) of Evalua		Stream Name	e and Informa	tion						
L. Egg	gering, R. M	angum				03-ST	R-B-07				
I. Channel (	Condition: Asse	ess the cross-secti	on of the stream a		dition (erosion, agg						]
	Opt	imal	Subo	ptimal	·	ginal	Po	or	Sev	vere	
	-	مر بد مولا		ew areas of active cted banks. Majority	Poor. Banks more	less than Severe or stable than Severe		unstable. Likely to		(or excavated),	
Channel Condition	100% stable banks. protection or natur (80-100%). ANI bars/bankfull ber Access to their or fully developed wic Mid-channel bars, few. Transient se	or active erosion; 80- Vegetative surface rall rock, prominent D/OR Stable point nches are present. iginal floodplain or le bankfull benches. and transverse bars diment deposition in 10% of bottom.	of banks are s Vegetative protec prominent (60 Depositional feat stability. The ban channels are well d has access to ba newly developed portions of the s sediment covers 10	table (60-80%). tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow efined. Stream likely nkfull benches, or Ifloodplains along reach. Transient 0-40% of the stream tom.	both banks. Vegetat 60% of banks. S bevertical or unde 60% of stream is c Sediment may be t contribute instabill contribute to si forming/present. A channels have vege	esent on 40-60% of tive protection on 40 treambanks may ercut. AND/OR 40-	are near vertical. Ei 80% of banks. Ve present on 20-40' insufficient to preve 60-80% of the str sediment.' temporary/transii contributing to inst shaped channels protection is prese	nt erosion. AND/OR eam is covered by Sediment is ent in nature, and	banks. Streamb rooting depth, r vertical/undercut. \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	ntained within the ed below average majority of banks /egetative protectio an 20% of banks, is sion. Obvious bank Erosion/raw banks D/OR Aggrading than 80% of stream d by deposition, stability. Multiple nd/or subteranean	
						ntribute to stability.	abs		flo	ow.	
Score	;	3	2	.4	] :	2	1.	.6		1	1
. KIPAKIAI			Cor	nditional Cate	gory		f length & width ma		NOTES>>The		
Riparian Buffers	Opt Tree stratum (dbh with > 60% tree c non-maitained un	imal  > 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.	Cor Subo	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till	por	NOTES>>Th deeply incise adjacent wet present.	ed; no	
Riparian Buffers	Opt Tree stratum (dbh with > 60% tree c non-maitained un	imal > 3 inches) present, anopy cover and a derstory. Wetlands	Cor Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30%	Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland, actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	deeply incise adjacent wet	ed; no	
Riparian	Opt Tree stratum (dbh with > 60% tree c non-maintained un located within th	imal > 3 inches) present, anopy cover and a derstory. Wetlands	Cor Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	deeply incise adjacent wet	ed; no	
Riparian Buffers  Condition Scores  1. Delineate ripa 2. Determine sco. 3. Enter the % F	Tree stratum (dbh with > 60% tree c non-maintained un located within th  1 arian areas along e quare footage for e: Riparian Area and	> 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cat	Low Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with - 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Conduth and width. Cake	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % F	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	deeply incise adjacent wet	ed; no	
Riparian Buffers  Condition Scores  1. Delineate ripa 2. Determine scores	Tree stratum (dbh with > 60% tree c non-maintained un located within th  1 arian areas along e quare footage for e: Riparian Area and	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cat	Low Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with - 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Conduth and width. Cake	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % F	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	deeply incise adjacent wet present.	ed; no lands	
Riparian Buffers  Condition Scores  Delineate ripa Determine so	Tree stratum (dbh with > 60% tree c non-maintained un located within the located within t	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  .5  .ach stream bank ach by measuring Score for each riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cat	Low Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with - 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Conduth and width. Cake	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % F	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums  tiparian qual 100  100%	deeply incise adjacent wet present.	ed; no lands	
Riparian Buffers  Condition Scores  Delineate ripa Determine scores  Enter the % F	Tree stratum (dbh with > 60% tree c non-maintained un located within the strategy of the control of the strategy of the strate	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cat	Low Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with - 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Conduth and width. Cake	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % F	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	deeply incise adjacent wet present.	ed; no lands	(C)
Condition Scores  Delineate rips Determine so Enter the % F Right Bank	Tree stratum (dbh with > 60% tree c non-maintained un located within the located within t	simal  > 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  .5  each stream bank ach by measuring 100% 1.2	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cat	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Conduct th and width. Calc the blocks below.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland, actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to the seed of the seed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums  tiparian qual 100  100%	deeply incise adjacent wet present.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	ed; no lands	
Condition Scores  Delineate rips Condition Scores  Delineate rips Condition Right Bank  Left Bank  Left Bank	Tree stratum (dbh with > 60% tree c non-maintained un located within the located within t	.5 .5 .ach stream bank ach by measuring 100% 1.2 .100% 1.2 .2 .3 inches) present, anopy cover and a derstory. Wetlands ae riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cat or estimating leng	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Cond th and width. Calc the blocks below.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland, actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to the seed of the seed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums  tiparian qual 100  100%	deeply incise adjacent wet present.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	ed; no lands	
Riparian Buffers  Condition Scores  1. Delineate ripa 2. Determine so 3. Enter the % F Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh with > 60% tree conon-maintained un located within the located within t	.5 .5 .ach stream bank ach by measuring 100% 1.2 .100% 1.2 .2 .3 inches) present, anopy cover and a derstory. Wetlands ae riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cat or estimating leng arian category in the containing both shrub layers or a non-maintained understory.  Stable habitat elepresent in 30-50% adequate for restimating leng	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Cond th and width. Calc the blocks below.  Conditiona ptimal  ments are typically of the reach and are maintenance of	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  ition Scores using culators are provided and leafy debris; all Category  Marginal Category  Stable habitat elepresent in 10-30% adequate for a degree of the content of	Ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.  ded for you below.  stable substrate; ginal  ments are typically of the reach and are maintenance of	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland, actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure I  of % F  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums Exparian qual 100 100%  100%	deeply incise adjacent wet present.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	ed; no lands	1.
Riparian Buffers  Condition Scores  1. Delineate ripa 2. Determine sc 3. Enter the % f Right Bank  Left Bank  Left Bank  Instream Habitat/ Available	Tree stratum (dbh with > 60% tree conn-maintained un located within the located within th	simal  > 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  5  ach stream bank ach by measuring 100% 1.2  100% 1.2  1100% 1.2  arried substrate size complexes, stable simal	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Into Condition Cate or estimating lenguarian category in the condition cate or estimating lenguarian category in the condition cate or estimating lenguarian category in the condition cate or estimating lenguarian category in the condition cate or estimating lenguarian category in the condition category in the category in th	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Condith and width. Calc the blocks below.  Conditiona ptimal  ments are typically of the reach and are	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  ition Scores using culators are provid  y and leafy debris; al Category  Marginal Stable habitat ele present in 10-30% adequate for r popul.	Ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.  ded for you below.  stable substrate; ginal  ments are typically of the reach and are maintenance of	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to the seed of the seed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums tiparian qual 100 100%  100%  is listed above are istable. Habitat	deeply incise adjacent wet present.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	ed; no lands	

Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB3	02080104	06/22/2016	03-STR-B07	500	1
	_ ALTERATION: Stream crossin rictions, livestock	igs, riprap, concre		al Category	ightening of chann	nel, channelization	, embankments,	NOTES>>Cu railroad tracl	
	Negligible	Mi	nor		erate	Sev	vere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of by any of the chan in the parameter g 80% of banks sh	of reach is disrupted nel alterations listed guidelines AND/OR ored with gabion, r cement.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH (	CONDITION	NDEX and S	TREAM COM	NDITION UNI	TS FOR THI	S REACH		•
IOTE: The Cls and R	CI should be rounded to 2 decimal places. The	ne CR should be round	ed to a whole number.				THE REACH	CONDITION IN	DEX (RCI) >>

RCI= (Sum of all Cl's)/5
COMPENSATION REQUIREMENT (CR) >>

0



NC DWQ Stream Identification Form Version 4.11

03-STR-B-07

Date: 06/22/2016	Project/Site: DC	Project/Site: DC2RVA - Area 03		79852
Evaluator: L. Eggering, R. Mangum	County: Stafford	I	Longitude: -77	7.427089
<b>Total Points:</b> 34.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) rmitten Perennia		
A. Geomorphology (Subtotal = 18)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No	= 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $7.5$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14 Loof littor	1.5		0.5	0

12. Presence of Baseflow	0	0	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
C Riology (Subtotal = 9	•			

C. Biology (Subtotal = 9				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other = 0	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet: 21 STR7.

Sketch:

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR **Impact** Project # **Project Name** Locality HUC Date SAR# Class length Factor 02080104 N/A DC2RVA - Area 03b ۷A R6 06/22/2016 1 Name(s) of Evaluator(s) **Stream Name and Information** 03-STR-B-08 L. Eggering, R. Mangum 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: High Poor: ow Suboptimal Non-maintained High Suboptimal Riparian areas Lawns, mowed, and maintained Riparian areas High Marginal Low Poor: with tree stratum Non-maintained vegetation. with tree stratum areas, nurseries Impervious (dbh > 3 inches) ense herbaceou riparian areas (dbh > 3 inches) no-till cropland; lacking shrub and present, with vegetation with Free stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands, Riparian 30% tree canor either a shrub tree stratum hav with > 60% tree canopy cover and an non-maintained understory. Wetlands to 60% tree pasture, sparsely vegetated nonenuded surfaces layer or a tree roduction, ponds cover and a **Buffers** canopy cover and row crops, active maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, or understory. nches) present present, tree herbaceous and recently seeded other comparable Recent cutover with <30% tree stratum (dbh >3 shrub lavers or a and stabilized, or conditions. inches) present with <30% tree (dense canopy cover. non-maintained understory. other comparable vegetation). condition. canopy cover with maintained understory High Low High Low High Low Condition 1.5 0.85 0.6 0.5 1.2 1.1 0.75 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.2 100% Rt Bank CI > 100% 1.20 CI % Riparian Area> Left Bank 0.85 Lt Bank CI > 0.85 1.03 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.52 NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number. RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF INSERT PHOTOS:



Left: Typical view upstream from Little Falls Right: Typical view downstream

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 06/22/2016

03-STR-B-08

Evaluator: L. Eggering, R. Mangum	County: Stafford	d	Longitude: -77	.42016
<b>Total Points:</b> 7.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) ermittent Perennial	Other e.g. Quad Name:	
1.0	Almont	Ma al-	Madanata	Ctura man
A. Geomorphology (Subtotal = 5.0 )	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence		1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes =	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $0.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria		1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes =	= 3
C. Biology (Subtotal = 2.0)				
18. Fibrous roots in streambed	3	2		0
19. Rooted upland plants in streambed	3	2	$\overline{\mathbf{O}}$	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	
*perennial streams may also be identified using other method	ods. See p. 35 of manua	al.		
Notes: Culvert 30, a 30" concrete pipe, is located	d near Little Falls R	oad. Field Sheet: 2	1STR8.	
Sketch: www.tw	atev t			

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR **Impact** Project # **Project Name** Locality HUC Date SAR# Class length Factor N/A DC2RVA - Area 03b ۷A R6 02080104 06/22/2016 1 Name(s) of Evaluator(s) **Stream Name and Information** 03-STR-B-09 L. Eggering, R. Mangum RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>>The braided, Optimal Marginal Poor Suboptimal dry channel empties Low Marginal: into a deeply incised High Poor: ow Suboptimal Non-maintained lense herbaceou High Suboptima Lawns, mowed, and maintained channel outside of the Riparian areas High Marginal: Low Poor: Riparian areas vegetation, riparian areas acking shrub and with tree stratum study area. 21-STR-10 with tree stratum areas, nurseries no-till cropland; Impervious surfaces, mine (dbh > 3 inches present, with nse herbaceou vegetation with Free stratum (dbh > 3 inches) present actively grazed pasture, sparsely resent, with 30% spoil lands. either a shrub layer or a tree Riparian 30% tree cano tree stratum, hay with > 60% tree canopy cover and annon-maintained understory. Wetlands to 60% tree nuded surface cover and a roduction, pond Buffers anopy cover and vegetated nonrow crops, active maintained laver (dbh > 3 open water. If areas. containing both maintained area eed lots, trails, o understory. inches) present with <30% tree present, tree recently seeded other comparable Recent cutover stratum (dbh >3 shrub layers or a and stabilized, or conditions. inches) present with <30% tree (dense canopy cover. non-maintained other comparable vegetation). understory. condition. canopy cover with maintained understory High Low High Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 1.2 % Riparian Area> 100% 100% Rt Bank CI > 1.20 CI Left Bank Score > 1.2 Lt Bank CI > 1.20 1.20

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> 0.60

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

**INSERT PHOTOS:** 



Top Left: Typical view of dry channel

Top Right: View of channel and adjacent steep slope

**NC DWQ Stream Identification Form Version 4.11** 

03-STR-B-09

110 2 11 6 201 00111 10101111100011011 1 0					
Date: 06/22/2016	Project/Site: DC	2RVA - Area 03	Latitude: 38.2	Latitude: 38.274875	
Evaluator: L. Eggering, R. Mangum	County: Stafford Longitude: -77.4167			7.416778	
<b>Total Points:</b> 11.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) rmittent Perennial		Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 6.0	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3	

A. Geomorphology (Subtotal = 6.0)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3

<sup>&</sup>lt;sup>a</sup> artificial ditches are not rated; see discussions in manual

B. F	vdroloav	(Subtotal =	1.5
------	----------	-------------	-----

12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes	= 3

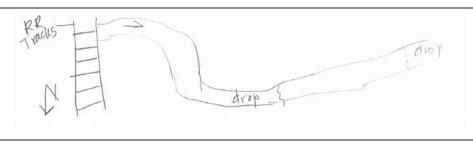
C	Riology	(Subtotal =	4.0
<b>\</b> J.		TOUDIUIAI —	7.0

18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75: (	OBL = 1.5 Other = 0	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Associated with Culvert 34. Field Sheet: 21STR10.

Sketch:



							ified Stream N				
	Impact	Impact/SAR	CAD#			nels classified as Cowardin	in wadeable chan		Duningt Name		Dun in at #
	Factor	length	SAR#	Date	HUC	Class.	Locality		Project Name		Project #
				06/22/2016	02080104	R2SB	VA e and Informa		C2RVA- Area (	DC e(s) of Evalua	N/A Name
			Is Run)	(Little Fal	R-B-10		e and imornia	Otream Name		ering, R. Ma	
				(=:::::::::::::::::::::::::::::::::::::			and prevailing cond	on of the stream a	_		
	ere	Seve	or	Po	y ginal	Conditional Categor	ptimal	Subo	imal	Opt	
	or excavated).	Deeply incised (	ied/incised.	Overwiden	ess than Severe or	Often incised, but I	~	Tu de la constant de	W.	"	
CI	tability. Severe ained within the blow average ajority of banks igetative protection 20% of banks, is on. Obvious bank Erosion/raw banks /OR Aggrading an 80% of stream by deposition, Multiple 4/or subterranean	vertical/lateral ins incision, flow cont banks. Streambe rooting depth, my extical/undercut. Ve present on less than not preventing erosi sloughing present. on 80-100%. AND channel. Greater the bed is covered contributing to ins thread channels an flow	iority of both banks orgetting present on 60- getative protection % of banks, and is nt erosion. AND/OR eam is covered by Sediment is ent in nature, and ability. AND/OR V- thave vegetative nt on > 40% of the diment deposition is	are near vertical. En- 80% of banks. Very present on 20-40% insufficient to prever 60-80% of the stressediment. Stemporary/transic contributing to insta	stable than Severe wer bank slopes. sesent on 40-60% of ive protection on 40 treambanks may rout. AND/OR 40-vered by sediment. emporary/transient, ty. Deposition that ability, may be NND/OR V-shaped on s and depositional	Poor. Banks more or Poor due to lo Erosion may be pre both banks. Vegetat 60% of banks. S bevertical or under 60% of stream is cc Sediment may be t contribute instabilist contribute to st forming/present. A	iew areas of active cted banks. Majority table (60-80%). ition or natural rock-80%) AND/OR tures contribute to nkfull and low flow effined. Stream likely unkfull benches, or it floodplains along reach. Transient 0-40% of the stream tom.	erosion or unproted of banks are sit Vegetative protect prominent (60-Depositional feat stability. The bar channels are well did has access to ba newly developed portions of the 1 sediment covers 10	or active erosion; 80 Vegetative surface ral rock, prominent J/OR Stable point toches are present. iginal floodplain or to bankfull benches, and transverse bars adment deposition n 10% of bottom.	100% stable banks. protection or natur (80-100%). AND bars/bankfull ben Access to their ori fully developed wid Mid-channel bars, a few. Transient se	Channel Condition
2.4		1	.6	1.	2	2	2.4	2	3	;	Score
		NOTES>>The		f length & width ma	measurements of	gory	areas along the enditional Cate	Con		BUFFERS: A	. RIPARIAN
		adjacent wetle present.	Low Poor:	High Poor: Lawns, mowed, and maintained areas,	Non-maintained, dense herbaceous	High Marginal:	Low Suboptimal: Riparian areas with	High Suboptimal: Riparian areas with	timai	Opt	
		adjacent wetl		High Poor: Lawns, mowed, and	Non-maintained,		Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and	High Suboptimal:	> 3 inches) present, anopy cover and a derstory. Wetlands	Tree stratum (dbh : with > 60% tree ca	Riparian Buffers
		adjacent wetl	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.	Tree stratum (dbh: with > 60% tree conon-maintained un located within th	Buffers  Condition
		adjacent wetl	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to 6 % R	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cate	> 3 inches) present, anopy cover and a aderstory. Wetlands he riparian areas.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the located within	Condition Scores  Delineate ripar
		adjacent wetl	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to 6 % R	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cate	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the located within	Condition Scores  Delineate ripar Determine squ
	ands	adjacent wetl	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to 6 % R	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cate	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1.  Tian areas along e tare footage for ea parian Area and \$	Condition Scores  Delineate ripa Determine squ
CI	ores*0.01)/2	adjacent wetl	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums tiparian qual 100 100%	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to 6 % R	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cate	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  .5  each stream bank is ach by measuring Score for each riparian areas.	Tree stratum (dbh: with > 60% tree ci non-maintained un located within th  1.  Tian areas along e parian Area and \$ % Riparian Area>	Condition Scores  Delineate ripa Determine squ. Enter the % Ri
CI 1.20	ands	adjacent wetli present.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to 6 % R	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cate	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  .5  each stream bank is ach by measuring Score for each riparian areas.	Tree stratum (dbh: with > 60% tree ci non-maintained un located within th  1.  Tian areas along e parian Area and \$ % Riparian Area> Score >	Condition Scores  Delineate ripar Determine squ Enter the % R
	ores*0.01)/2 1.20	adjacent wetle present.  Cl= (Sum % RA * Sc Rt Bank Cl > Lt Bank Cl >	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  the sums tiparian qual 100  100%	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to 6 % R	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	High Marginal: Non-maintained, dense herbaceous vegetation with > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  tegories and Cond the and width. Calc the blocks below.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate or estimating leng	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  .5  each stream bank is ach by measuring 100% 1.2	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1.  ian areas along e parian Area and \$ % Riparian Area> Score >  % Riparian Area> Score >  HABITAT: Va	Condition Scores  Delineate ripar Determine squ Enter the % Ri Right Bank  Left Bank
	ores*0.01)/2 1.20	adjacent wetle present.  Cl= (Sum % RA * Sc Rt Bank Cl > Lt Bank Cl >	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums tiparian qual 100 100%  100%	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to defend the seeded and the seeded and seeded and stabilized, or other comparable condition.	Non-maintained, dense herbaceous vegetation, riparian areas lacking shruch and tree stratum, hay production, ponds. open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	High Marginal: Non-maintained, dense herbaceous vegetation with > 3 inches) present, with <30% tree canopy cover.  High  0.85  ttion Scores using culators are provid	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  tegories and Condight and width. Calc the blocks below.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate or estimating lenguarian category in the condition cate or serious and containing the condition cate or estimating lenguarian category in the condition cate or estimating lenguarian category in the condition cate or estimating lenguarian category in the condition cate or estimating lenguarian category in the condition category in the condition category in the condition category in the category in	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  -5	Tree stratum (dbh: with > 60% tree ci non-maintained un located within th  1.  ian areas along e parian Area and \$ % Riparian Area> Score >  KRiparian Area> Score >  HABITAT: Va SAV; riffle poole of	Condition Scores  Delineate ripar Determine squ Enter the % Right Bank  Left Bank INSTREAM
	ores*0.01)/2 1.20	adjacent wetle present.  Cl= (Sum % RA * Sc Rt Bank Cl > Lt Bank Cl >	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums tiparian qual 100 100%  100%  1isted above are stable. Habitat ally present in less	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr  of % R  Blocks er  Habitat elements lacking or are ur	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	High Marginal: Non-maintained, dense herbaceous vegetation with > 3 inches) present, with <30% tree canopy cover.  High  0.85  Ition Scores using culators are provid	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  tegories and Cond the and width. Calc the blocks below.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition Cate or estimating lenguarian category in the categor	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  .5  .5  .ach stream bank in a derstory and a derstory area of the stream bank in a derstory and a derstory area of the stream bank in a derstory and a derstory area of the stream bank in a derstory and a derstory area of the stream bank in a derstory and a derstory area of the stream bank in a derstory.  .5  .5  .5  .100%  1.2  .100%  1.2  .100%  1.2  .100%	Tree stratum (dbh: with > 60% tree or non-maintained un located within th  1.  rian areas along e are footage for ea parian Area and \$ % Riparian Area> Score >  % Riparian Area> Score >  HABITAT: Va SAV; riffle poole of Opt	Condition Scores  Delineate ripar Determine squ Enter the % Ri Right Bank  Left Bank

	St	tream Ir	npact A	ssessm	ent For	m Page	2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02080104	06/22/2016	03-STR-B10	500	1
	ALTERATION: Stream crossin ictions, livestock	gs, riprap, concre			ightening of chanr	nel, channelization	, embankments,	NOTES>>Cu railroad tra	
	Negligible	Mi	Conditiona nor	al Category Mod	erate	Sev	vere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel	is disrupted by any of the channel	Greater than 80% of by any of the chan in the parameter g	of reach is disrupted nel alterations listed guidelines AND/OR ored with gabion, r cement.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH (	CONDITION	NDEX and S	TREAM CON	NDITION UNI	ITS FOR THI	S REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.32 RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF



NC DWQ Stream Identification Form Version 4.11 Little Falls Run 03-STR-B-10

110 B 11 Q Bel culli luciloni cultion 1 of m 1 of m	31011 1111	
Date: 06/22/2016	Project/Site: DC2RVA - Area 03	Latitude: 38.273665
Evaluator: L. Eggering, R. Mangum	County: Stafford	Longitude: -77.414766
<b>Total Points:</b> 51.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 30)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 12 )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 9.5				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
			2	3
21. Aquatic Mollusks	0			3
21. Aquatic Mollusks 22. Fish	0	0.5	1	1.5
·			1	
22. Fish	0	0.5	<u> </u>	1.5

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Culvert 33, arch concrete, stamped 1942; fish and water moccasin observed. Field Sheet: 21STR9 Little Falls Run.

FACW = 0.75; OBL = 1.5 Other = 0

Sketch:

26. Wetland plants in streambed

#### **Ephemeral Stream Assessment Form (Form 1a)**

Unified Stream Methodology for use in Virginia

		For us	e in epnemerai s	treams				
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Area 03b	VA	R6	02080104	06/22/2016			1

Name(s) of Evaluator(s) Stream Name and Information

L. Eggering, R. Mangum 03-STR-B-11

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

	Conditional Category							NOTES>>No	)
	Optimal	Subo	otimal	Mar	ginal	Po	oor	inundation.	Deeply
Riparian Buffers	with > 60% tree canopy cover and an	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <309% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	incised in t	
		High	Low	High	Low	High	Low	Ī	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5		
				dition Coores vois	a the descriptors	_			
. Delineate ripa	arian areas along each stream bank	into Condition Car	tegories and Cond	ullion Scores usin	ig the descriptors.	Ensure 1	the sums		
. Determine so	arian areas along each stream bank uare footage for each by measuring		•		•				
. Determine so elow.	· ·	or estimating leng	gth and width. Ca	alculators are prov	•	of % F	the sums Riparian equal 100		
Determine so elow.	uare footage for each by measuring	or estimating leng	gth and width. Ca	alculators are prov	•	of % F	Riparian		
. Determine so elow.	uare footage for each by measuring	or estimating leng	gth and width. Ca	alculators are prov	•	of % F	Riparian equal 100 100%		
Determine so elow.	Riparian Area and Score for each rip % Riparian Area > 100% Score > 1.2	or estimating leng	gth and width. Ca	alculators are prov	•	of % F	Riparian equal 100 100%	CI= (Sum % RA * S	
Determine so elow.	uare footage for each by measuring  Riparian Area and Score for each rip  Riparian Area> 100%	or estimating leng	gth and width. Ca	alculators are prov	•	of % F	Riparian equal 100 100%	Cl= (Sum % RA * S Rt Bank Cl >	Scores*0.01)/2 1.20

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.60

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Typical view of stream at upstream end

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

03-STR-B-11

Latitude: 38.270242

Evaluator: L. Eggering, R. Mangum	County: Stafford	d	Longitude: -77	'.396444
<b>Total Points:</b> 11.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 5.0	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	<u> </u>	1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual  B. Hydrology (Subtotal = 1.5)				
12. Presence of Baseflow		1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3

C. Biology (Subtotal = 5.0

Date: 06/22/2016

18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other = 0	0

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Culvert near railroad located in heavily wooded area. Trenches and berms present. 21STR11.

Sketch:

			Unif			for use in Virg	Form			
Project #		Project Name	,	For us	e in ephemeral s Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC	2RVA - Area	 03b	VA	R6	02080104	06/22/2016		lengin	1
	e(s) of Evalua	. ,	Stream Nam	e and Inform	ation					
L. Egg	gering, R. M	angum				03-ST	R-B-12			
2. RIPARIAN	N BUFFERS: A	Assess both bank	's 100 foot riparia	n areas along the	entire SAR. (rou	gh measurements	of length & width	may be acceptab	le)	
			Con	ditional Cate	gory	-		<u> </u>	NOTES>>	
	Opti	mal	Subo	ptimal I	Mar	ginal	Po	oor	Missing Fiel	
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca non-maintained und are	nopy cover and an derstory. Wetlands	containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	this stream to 21STR11, numbers we for this shee Hydrograph Database do show this st	which re used et, Nationa y es not
Condition			High	Low	High	Low	High	Low		
Condition Scores	1.	5	1.2	1.1	0.85	0.75	0.6	0.5		
Determine sq below.	arian areas along equare footage for each grant and sea and se	ach by measuring	or estimating len	gth and width. Ca			of % F	Riparian equal 100		
	I., s	4000/						4000/	CI= (Sum % RA * So	
Left Bank	% Riparian Area>	100%						100%	Rt Bank CI >	1.20
		REACH C	ONDITION I	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH		
NOTE: The Cls and I	RCI should be rounded								ONDITION IND	EX (RCI) >>
									CI= (Riparian CI)	
									ON REQUIREM	ENT (CR) >>
DESCRIBE F	PROPOSED III	MPACT:								

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 06/22/2016

03-STR-B-12

Evaluator: L. Eggering, R. Mangum	County: Staffor	rd	Longitude: -77	7.396258
<b>Total Points:</b> 11.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determ Ephemeral nte	ination (circle one) ermittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 5.0	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
Sinuosity of channel along thalweg	0	$\rightarrow$	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1)	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $1.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	(1.5)
17. Soil-based evidence of high water table?	N	0 = 0	Yes	= 3
C. Biology (Subtotal = 5.0				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	
*perennial streams may also be identified using other method	ds. See p. 35 of manua	al.		
Notes: Missing Field Sheet, this stream connects	to 21STR11, which	ch numbers were us	ed for this sheet	t, National
Hydrography Database does not show this	s stream.			
Sketch:				

#### **Ephemeral Stream Assessment Form (Form 1a)**

Unified Stream Methodology for use in Virginia

		For us	e in ephemeral s	treams				
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Area 03b	VA	R6	02080104	06/22/2016			1

Name(s) of Evaluator(s) Stream Name and Information

L. Eggering, R. Mangum 03-STR-B-13

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Buffers    Non-maintained understory. Weltands areas.   Non-maintained understory.   Weltands areas.   Non-maintained understory.   Weltands areas.   Non-maintained understory.   Weltands areas.   Non-maintained understory.   Weltands areas.   Non-maintained understory.   Non-		Conditional Category									
Riparian Buffers  Tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and an non-maintained understory. Wetlands areas.  High Suboptimat: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and an non-maintained understory. Wetlands areas.  High Low High Low High Low High Low understory. Wetlands shrub layers or a non-maintained understory. Wetlands areas.  High Suboptimat: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and an non-maintained understory. Wetlands areas.  High Marginat: Non-maintained understory. Wetlands or a non-maintained understory. Wetlands areas.  High Low High Low High Low this 20% tree canopy cover with a shrub layers or a non-maintained understory. Recent cutower (dense vegetation). Wetlands areas along each stream bank into Condition Categories and Condition Scores using the descriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you low.  Enter the % Riparian Areas 100%  Score > 1.2  Migh Bank  Score > 1.2  Non-maintained dines behaceous vegetation with 30% tree canopy on with 410% tree canopy on water. If present, tree canopy cover with maintained year (dbh > 3 inches) present, with 20% tree canopy cover with maintained area, represent, tree canopy cover with maintained area, represent, tree canopy cover with maintained area, represent, tree canopy cover with an analyse of a tree canopy cover with 20% tree canopy cover with 30% tree canopy cover with 30% tree canopy cover with maintained year (dbh > 3 inches) present, with 30% tree canopy cover with maintained area, represent, tree canopy cover with maintained year (dbh > 3 inches) present, with 30% tree canopy cover with maintained year (dbh > 3 inches) present, with 30% tree canopy cover with maintained year (dbh > 3 inches) present, with 30% tree canopy cover with maintained year (dbh > 3 inches) present, with 30% tree canopy cover with maintained year (dbh > 3		Optimal	Subo	ptimal	Mar	ginal	Po	oor	21-STR-12		
Condition Scores   1.5	Riparian Buffers	with > 60% tree canopy cover and an non-maintained understory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Scores   1.5   1.2   1.1   0.85   0.75   0.6   0.5			High	Low	High	Low	High	Low			
Determine square footage for each by measuring or estimating length and width. Calculators are provided for you low.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank    % Riparian Area   100%   100%   100%	Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5			
Enter the % Riparian Area and Score for each riparian category in the blocks below.   Blocks equal 100	. Delineate ripa	rian areas along each stream bank	into Condition Ca	tegories and Con	ondition Scores using the descriptors. Ensure the sums						
Right Bank	. Determine squelow.	uare footage for each by measuring	or estimating len	gth and width. Ca	alculators are prov	vided for you	of % F	Riparian			
Score >   1.2   Cl= (Sum % RA * Scores*0.01)/2	. Enter the % R	Riparian Area and Score for each rip	parian category in	the blocks below.			Blocks e	equal 100			
Score >   1.2     Cl= (Sum % RA * Scores*0.01)/2	Right Bank	% Riparian Area> 100%						100%			
Left Bank         % Riparian Area>         100%         Rt Bank CI >         1.20         C           Score >         1.2         Lt Bank CI >         1.20         1.20         1.20	Mignit Dank	Score > 1.2									
Score >   1.2   Lt Bank Cl >   1.20   1.				1					CI= (Sum % RA * S	Scores*0.01)/2	
Score > 1.2 Lt Bank Cl > 1.20 1.	Left Bank							100%	Rt Bank CI >	1.20	C
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH		Score > 1.2							Lt Bank CI >	1.20	1.
		REACH C	ONDITION I	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.60

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

**INSERT PHOTOS:** 



Typical view of stream at downstream end

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 06/22/2016

03-STR-B-13

County: Stafford	d	Longitude: -77	7.393911
		Other e.g. Quad Name:	
Absent	Weak	Moderate	Strong
0	1	2	3
0	1	2	3
0	1	2	3
0	1	2	3
0	1	2	3
0	1	2	3
0	1	2	3
0	1	2	3
0	0.5	1	1.5
0	0.5	1	1.5
No	0 = 0	Yes :	= 3
	1		
_	1	2	3
0	1	2	3
1.5	1	0.5	0
0	0.5	1	1.5
0	0.5	1	1.5
No	0 = 0	Yes :	= 3
3	2	1	0
3	2	1	0
0	1	2	3
0	1	2	3
0	0.5	1	1.5
0	0.5	1	1.5
0	0.5	1	1.5
0	0.5	1	1.5
		L = 1.5 Other = 0	
ls. See p. 35 of manua	u.		
	Absent  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 1 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 0 5 0 0 0 5 0 0 0 5 0 0 0 5 0 0 0 5 0 0 0 5 0 0 0 5 0 0 0 5 0 0 0 5 0 0 0 5 0 0 0 5 0 0 0 5 0 0 0 5 0 0 0 5 0 0 0 5 0 0 5 0 0 5 0 0 5 0 0 5 0 0 5 0 0 5 0 0 5 0 0 5 0 0 5 0 0 5 0 0 5 0 0 5 0 0 5 0 0 5 0 5 0 0 5 0 0 5 0 5 0 0 5 0 5 0 0 5 0	Absent   Weak   Moderate

### **Ephemeral Stream Assessment Form (Form 1a)**

Unified Stream Methodology for use in Virginia

		For us	e in ephemeral s	treams				
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Area 03b	VA	R6	02080104	06/22/2016			1
				·	•			

Name(s) of Evaluator(s) Stream Name and Information

L. Eggering, R. Mangum 03-STR-B-14

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and an non-maintained understory. Wetlands areas.  Tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and a non-maintained understory. Wetlands areas.  Tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  High Low High Low High Low High Low High Low High Low on serior present areas along each stream bank into Condition Categories and Condition Scores using the descriptors. The square footage for each by measuring or estimating length and width. Calculators are provided for you as a catively grazed pasture, sparsely wegetated non-maintained understory. Recent cutover (dense vegetation).  High Low High Low High Low High Low on serior present, with <30% tree canopy cover with maintained understory.  The square footage for each by measuring or estimating length and width. Calculators are provided for you as Riparian Area and Score for each riparian category in the blocks below.  The square footage for each stream bank into Condition Categories and Condition Scores using the descriptors. The square footage for each by measuring or estimating length and width. Calculators are provided for you as Riparian Area and Score for each riparian category in the blocks below.  The square footage for each by measuring or estimating length and width. Calculators are provided for you are square footage for each stream bank into Condition Scores using the descriptors. The square footage for each by measuring or estimating length and width. Calculators are provided for you are square footage for each square footage for each square footage for each square footage for each square footage for each square footage for each square footage for each square footage for each square footage for each square footage for each square footage for each square footage for each square footage for each square footage for each square footage for each square footage for each s		Conditional Category NOTES:								
High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an containing both herbaceous and shrub layers or a non-maintained understory.  If the stratum (dbh > 3 inches) present, with > 30% tree (anopy cover. with > 3 inches) present, tree stratum, (dbh > 3 inches) present, with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with < 30% tree (anopy cover. with		Optimal	Subo	ptimal	Mar	ginal			Adjacent to	railroad
on S 1.5 1.2 1.1 0.85 0.75 0.6 0.5  e riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  the square footage for each by measuring or estimating length and width. Calculators are provided for you  a % Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100  Ank  % Riparian Area> 100%  Score > 1.2  % Riparian Area> 100%  100%	Riparian Buffers	with > 60% tree canopy cover and an non-maintained understory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	tracks. 21-S	TR-13
1.5 1.2 1.1 0.85 0.75 0.6 0.5  The riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  The square footage for each by measuring or estimating length and width. Calculators are provided for you  The Riparian Area and Score for each riparian category in the blocks below.  The Riparian Area 100%			High	Low	High	Low	High	Low	İ	
ne square footage for each by measuring or estimating length and width. Calculators are provided for you  of % Riparian  Blocks equal 100  Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100  100%  Score > 1.2  % Riparian Area> 100%  % Riparian Area> 100%  100%	Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5		
## Riparian Area and Score for each riparian category in the blocks below.  ### Blocks equal 100  ### Blocks equal 100  ### Score > 1.2  ### Riparian Area   100%  ### Riparian Area   100%  ### Riparian Area   100%  ### Riparian Area   100%	Delineate ripa	rian areas along each stream bank	into Condition Ca	tegories and Con	dition Scores usin	g the descriptors.	Ensure	the sums		
% Riparian Area>   100%   100%     100%       100%       100%	Determine squ low.	uare footage for each by measurin	g or estimating len	gth and width. Ca	alculators are prov	rided for you	of % F	Riparian		
Score > 1.2   100%	Enter the % R	iparian Area and Score for each ri	parian category in	the blocks below.			Blocks e	equal 100		
Score > 1.2   100%	Right Bank	% Riparian Area> 100%						100%	]	
nk	agat Dank	Score > 1.2								
nk										cores*0.01)/2
	Left Bank							100%	Rt Bank CI >	1.20
Score > 1.2		Score > 1.2							Lt Bank CI >	1.20
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REA			ONDITION I	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REA	СН	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.60

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Left: Culvert carrying stream

Right: Typical view at downstream end

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 06/22/2016

03-STR-B-14

Evaluator: L. Eggering, R. Mangum	County: Staffor	<sup>-</sup> d	Longitude: -77	7.388324
<b>Total Points:</b> 9.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name	:
A. Geomorphology (Subtotal = 5.0	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
Sinuosity of channel along thalweg	0		2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $0.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes	= 3
C. Biology (Subtotal = $4.0$				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians		0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other =	0)
*perennial streams may also be identified using other method				
Notes: Water stained leaves, trees growing in bott	om of channel. F	ield Sheet: 21STR1	3.	
Sketch:	T+culver+		٠	
ę.				

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# length Class **Factor** N/A DC2RVA - Area 03b R6 02080104 06/24/2016 VA Name(s) of Evaluator(s) Stream Name and Information L. Eggering, R. Mangum 03-STR-B-15 . RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable Conditional Category NOTES>> Optimal Braided ephemeral Suboptimal Marginal Poor Low Marginal: channel. Little High Poor: lon-maintained nse herbaceou ow Suboptima Riparian areas ligh Suboptima inundation. 21-STR-15 High Marginal: Lawns, mowed, and maintained Low Poor: Riparian areas with tree stratum Non-maintained vegetation, with tree stratum areas, nurseries Impervious (dbh > 3 inches) present, with >30% tree canop ense herbaceou riparian areas (dbh > 3 inches) present, with 30% to 60% tree no-till cropland vegetation with either a shrub lacking shrub and tree stratum, hay ree stratum (dbh > 3 inches) prese actively grazed Riparian with > 60% tree canopy cover asture, sparsely nuded surface open water. If present, tree stratum (dbh >3 cover and a layer or a tree Buffers anopy cover and containing both herbaceous and row crops, active feed lots, trails, or other comparable aintained understory. Wetland vegetated non-maintained area layer (dbh > 3 inches) present maintained recently seeded Recent cutove with <30% tree shrub layers or a non-maintained and stabilized, or conditions inches) present, with <30% tree canopy cover with (dense canopy cover. vegetation) understory. maintained understory High High Low High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 1.1 Scores . Delineate iparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums escriptors 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank 1.2 Score > CI % Riparian Area: 100% 100% Rt Bank CI > 1.20 Left Bank 1.2 Lt Bank CI > 1.20 1.20 Score > REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numl THE REACH CONDITION INDEX (RCI) >> 0.60

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 06/24/2016

03-STR-B-15

	,			
Evaluator: L. Eggering, R. Mangum	County: Staffor	rd	Longitude: -77	.386398
Total Points: 9	Stream Determ	ination (circle one)	Other	
Stream is at least intermittent		ermittent Perennial	e.g. Quad Name:	
if ≥ 19 or perennial if ≥ 30*	Боношения	Time Toronna	o.g. Quad rvamo.	
A. Geomorphology (Subtotal = $\frac{2.5}{}$ )	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1)	2	3
Sinuosity of channel along thalweg	0		2	3
3. In-channel structure: ex. riffle-pool, step-pool,				
ripple-pool sequence		1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes :	
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 1.5				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1_	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes :	= 3
C. Biology (Subtotal = $5.0$				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians		0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	
*perennial streams may also be identified using other meth	ods. See p. 35 of manua			
			eld Sheet: 21ST	R15.
Notes: Only small reaches are inundated; wet, o	4 12			
OKCIOII.				
LI TILL		111		
1111				
-//		baid.	dephenent Warm	
		0.000.000.000.000.000	Mesay	

Conditional Category	Project Name  DC2RVA - Area GBb  VA  DC2RVA - Area GBb  VA  RE  C2080104 NA  NA  DC3-STR-B-16  RPARIAN SUFFERS: Assess bein bears to Do for general assess along the celler SAFE (Fig. Name) and information  C3-STR-B-16  RPARIAN SUFFERS: Assess bein bears to Do for general assess along the celler SAFE (Fig. Name) and information  Conditional Category	Project # Project Name   Locality   Class.   N/A   DC2RVA - Area 03b   VA   R6   02080104   N/A     1   1   1   1   1   1   1   1   1							troame				
N/A DC2RVA - Area 03b VA R6 02080104 N/A 1  Name(s) of Evaluator(s) Stream Name and Information  O3-STR-B-16  RIPARIAN BUFFERS: Assess both banks 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category Stream Name and Information  O3-STR-B-16  RIPARIAN BUFFERS: Assess both banks 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category Stream Name and Information Informat	Name(s) of Evaluator(s)  RIPARIAN BUFFERS: Accesses both bursh. is 100 for search as many and information  Opinional  Suboptim	NA DC2RVA - Area 03b VA R6 02090144 N/A 1  Name(s) of Evaluator(s)  Stream Name and information  G. STR.B-16  RIPARIAN BUFFERS: Assess both basks 100 loss tissues were after the entre 03b; Bugst insecurement of terms 4 width may be accordance.  Conditional Category  Optimal Suboptimal High Budgetimes High Suboptimes with the signal of the conditional Category with the signal of the condition Category with the signal of the conditional Category with the signal of the conditional Category with the signal of the conditional Category with the signal of the conditional Category with the signal of the conditional Category with the signal of the conditional Category with the signal of the conditional Category with the signal of the category with the signal of the category with the signal of the category with the signal of the category with the signal of the category with the signal of the category with the signal of the category with the signal of the category with the signal of the category with the signal of the category wi	Project #		Project Name	e		Cowardin		Date	SAR#	•	
RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal  High Suboptimal  Normanianed, Riparian areas, with ree stratum (dbh > 3 inches) present, with now three stratum (dbh > 3 inches) present, with now t	Riparian Riparian Riparian Surfers Survey and Survey (100 libor riparian units) Riparian Ripa	Riparian Immediate March State Control	N/A	DC	2RVA - Area	03b	VA		02080104	N/A		iongin	
Conditional Category	Conditions   Suboptimal   Sub	Riparian    Condition   Suboptimal   Subopti	Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Inform	ation	03-STI	R-B-16			
Condition   Scores	Riparian  Note detailed (Most of Control of	Riparian Buffers  The element allow 3 inches presents with the authority of the common and a com	RIPARIA	N BUFFERS: A	Assess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (ro			h may be accepta	able)	
Riparian Tree stratum (dbh > 3 inches) present, with search with > 60% tree canopy cover and an on-maintained understory. Wetlands areas.  High Suboptimal: Riparian areas with the stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an on-maintained dinderstory. Wetlands areas.  High Low High Low High Low High Low High Low Understory. Wetlands areas and shrub layers or an on-maintained understory.  High Suboptimal: Riparian areas with the stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an on-maintained dinderstory. Wetlands areas.  High Suboptimal: Riparian areas with the stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an on-maintained dinderstory.  High Low High Low High Low High Low Determine square footage for each by measuring or estimating length and width. Calculators are provided for you low.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Enter the % Riparian Area and Score for each riparian category in the score for each riparian category in the score for each riparian category in the score for ea	Riparian  The citation (life - 3 moving) present with the contract of the company	Page   Page				Cor	nditional Cate	gory				NOTES>>	
Riparian areas Riparian areas with rese stratum (dbh > 3 inches) present, with present	Riparian The criminal patients of the company of th	Riparian  The cristian (Eth 3 Incide) present, with the cristian (Eth 2 Incide) present, with the cristian (Eth 3 Incide) present, with a 19th of 19th the cristian (Eth 3 Incide) present, with a 19th of 19th the cristian (Eth 3 Incide) present, with a 19th of 19th the cristian (Eth 3 Incide) present, with a 19th of 19th the cristian of 19th the cristian of 19th the cristian of 19th the cristian of 19th the cristian of 19th the cristian of 19th the cristian of 19th the cristian of 19th the cristian of 19th the critical of 19th the c		Орш	imai	Subo		IVIAI	Low Marginal:		or		•
Condition Scores  1.5 1.2 1.1 0.85 0.75 0.6 0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the scriptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you low.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100  Score > 1.2  Cl= (Sum % RA * Scores*0.01)/2  Cl= (Sum % RA * Scores*0.01)/2  REPUTE: The Cis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5  Delineate inputs areas along each stream bank into Condition Categories and Condition Storres using the scarcipatria.  Scripture square footloge for each tyreasuling or estimating length and width. Calculators are provided for you be condition. Storres and Storres or each reparting category in the blocks below.  Right Bank 5. Reparter Assec 100%  Score > 1.2  Left Bank 5. Reparter Assec 100%  Score > 1.2  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  SERT PHOTOS:	Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5  Delineate parain areas along each stream bark into Condition Categories and Condition Scores using the scriptors.  Secretary of the Condition Categories and Condition Scores using the scriptors.  Fight Bank 9, Reparter Asses 100%  Score 1.2 1.0 0.85 0.75 0.6 0.5  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE Cits and RCI should be reunded to 3 decimal places. The Cit should be reunded to a whole number.  REACH CONDITION INDEX (RCI) >>  REACH	•	with > 60% tree ca non-maintained und	nopy cover and an derstory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches), present, with 30% to 60% tree to anopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present, with <a href="https://doi.org/10.1000/">30 inc</a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a>	dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, recently seeded and stabilized, or other comparable	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable		
Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the secriptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you alow.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank    Mail Not	Scores 1.2 1.2 1.2 Enter the % Ripartian Areas and Score for each ripartian category in the blocks below.    Right Bank   % Repertur Areas   100%   1	Scores 1.2 1.2 1.5 U.5 U.5 U.5 U.5 U.5 U.5 U.5 U.5 U.5 U	Condition		_				ı				
Determine square footage for each by measuring or estimating length and width. Calculators are provided for you allow.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank    % Riparian Area   100%   100%     Score > 1.2	Determine square footage for each by measuring or estimating length and width. Calculators are provided for you low.  Determine square footage for each inpartian category in the blocks below.  Blocks equal 100	Determine square foctage for each by measuring or estimating length and width. Calculations are provided for you better the % Ripartian Areas and Score for each ripartian category in the blocks below.    **Right Bank	Scores										
Enter the % Riparian Area and Score for each riparian category in the blocks below.   Blocks equal 100	Shocks equal 100   Shocks equa	State   100%	scriptors. Determine sq	· ·			ŭ						
Score   1.2	Comparison   Com	Left Bank   Score >   1.2		1		iparian category i	n the blocks below	w.		Blocks e	•		
Left Bank    Note   Not	Left Bank Repaired Aceas 100% Re Bank CI > 1.20  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE CRS and RCI should be recorded to 2 decimal places. The CR should be recorded to a whole number.  RCIe (Righarian Ci)/2  COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  SERT PHOTOS:	Left Bank Repaired Aceas 100% Re Bank CI > 1.20  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE CRS and RCI should be recorded to 2 decimal places. The CR should be recorded to a whole number.  RCIe (Righarian Ci)/2  COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  SERT PHOTOS:	ight Bank								100%		
Score > 1.2   Lt Bank Cl > 1.20	Left Bank   Score > 1.2	Left Bank    Score   1.2									1000/		
TE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	THE REACH CONDITION INDEX (RCI) > RCI= (Rigarian CI)/2 COMPENSATION REQUIREMENT (CR) > CR = RCI XLF XIF  SERT PHOTOS:	THE REACH CONDITION INDEX (RCI) > RCI= (Rigarian CI)/2 COMPENSATION REQUIREMENT (CR) > CR = RCI XLF XIF  SERT PHOTOS:	_eft Bank								100%		
RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  SERT PHOTOS:	RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  SERT PHOTOS:											
COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  SERT PHOTOS:	COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  SERT PHOTOS:			REACH C	ONDITION I	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH		
CR = RCI X LF X IF	CR = RCIXLF XIF  CR = RCIXLF XIF	SERT PHOTOS:  CR = RCI X LF X IF	TE: The CIs and F	RCI should be rounded					NDITION UN		THE REACH C		. ,
	ESCRIBE PROPOSED IMPACT:	ESCRIBE PROPOSED IMPACT:							NDITION UN		THE REACH C RC COMPENSATION	CI= (Riparian C ON REQUIREN	I)/2
									NDITION UN		THE REACH C RC COMPENSATION	CI= (Riparian C ON REQUIREN	I)/2

Project/Site: DC2RVA - Area 03

#### NC DWQ Stream Identification Form Version 4.11

Date:

#### 03-STR-B-16

Latitude:

Evaluator:	County: Staffor	·d	Longitude:	
<b>Total Points:</b> 0 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determ Ephemeral	ination (circle one) ermittent Perennial	Other e.g. Quad Name:	
·				
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence				
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel  a artificial ditches are not rated; see discussions in manual	I N	0 = 0	Yes:	= 3
B. Hydrology (Subtotal =)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	= 3
C. Biology (Subtotal =)	•	<u>'</u>		
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	)
*perennial streams may also be identified using other methods	. See p. 35 of manua	al.		
Notes: NC data for this resource not available (no f	ield sheets)			
Sketch:				

					or use in Virg						
	Impact Factor	Impact/SAR length	SAR#	Date	HUC	nels classified as Cowardin Class.	Locality		Project Name		Project #
				06/22/2016	02080104	R2SB	VA		C2RVA - Area		N/A
			ak Run)	(White O	R-R-17a		e and Informa	Stream Name		e(s) of Evalua Jering, R. M	
			ak itulij	(Winte O			and prevailing cond	on of the stream a	ess the cross-secti		
	ere	Seve	or	Po	у	Conditional Categor			timal		
	5	1		1	~	1	~	1	and the second		
CI	tability. Severe ained within the d below average ajority of banks getative protection 20% of banks, is on. Obvious banks Erosion/raw banks /OR Aggrading an 80% of stream by deposition, tability. Multiple 1/or subterranean	Deeply incised ( vertical/lateral ins incision, flow cont banks. Streambec rooting depth, ms vertical/undercut. Ve present on less thar not preventing erosis sloughing present. E on 80-100%. AND channel. Greater th bed is covered I contributing to ins thread channels and	unstable. Likely to ority of both banks osion present on 60-getative protection & of banks, and is nt erosion. AND/OR aam is covered by Sediment is and baility. AND/OR V-have vegetative nt on > 40% of the diment deposition is	80% of banks. Veg present on 20-40%	stable than Severe wer bank slopes. seent on 40-60% of ive protection on 40 treambanks may rout. AND/OR 40-vered by sediment. emporary/transient, ty. Deposition that ability, may be ND/OR V-shaped tative protection on s and depositional	or Poor due to lo Erosion may be pre both banks. Vegetat 60% of banks. S bevertical or unde 60% of stream is co Sediment may be t contribute instabili contribute to st forming/present. A	ew areas of active ted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow efined. Stream likely nkfull benches, or Ifloodplains along reach. Transient 0-40% of the stream tom.	erosion or unproted of banks are sit Vegetative protect prominent (60- Depositional feat stability. The bar channels are well du has access to ba newly developed portions of the re-	or active erosion; 80- s. Vegetative surface ral rock, prominent D/OR Stable point nches are present, riginal floodplain or de bankfull benches, and transverse bars addiment deposition n 10% of bottom.	100% stable banks. protection or natur (80-100%). AND bars/bankfull ber Access to their or fully developed wid Mid-channel bars, few. Transient se	Channel Condition
2.4		1	.6	1.	2	2	.4	2	3	;	Score
		NOTES>>		Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-til cropland; actively grazed pasture,	comments of the state of the st	gory	nditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present,	Subor Subortimal: Riparian areas with tree stratum (dbh > 3 inches) present,	timal  > 3 inches) present.	Opt	
			denuded surfaces, row crops, active feed lots, trails, or	non-maintained area, recently seeded and	hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present,	either a shrub layer or a tree layer (dbh > 3 inches) present, with <30%	with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	canopy cover and a nderstory. Wetlands he riparian areas.	non-maintained un	Riparian Buffers
			other comparable conditions.	stabilized, or other comparable condition.	with <30% tree canopy cover with maintained understory.	tree canopy cover.	vegetation).	understory.			
			other comparable conditions.	comparable condition.	with <30% tree canopy cover with maintained understory.	High	Low	High	l.5	1	Condition
			Low 0.5  he sums ciparian qual 100	comparable condition.  High  0.6	with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High 0.85	Low 1.1 egories and Cond	High 1.2  Into Condition Cator estimating leng	each stream bank ach by measuring Score for each ripa	urian areas along e uare footage for ea tiparian Area and S	Scores  Delineate ripa Determine squ
			Low 0.5 he sums	comparable condition.  High  0.6  Ensure the of % R	with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High 0.85	Low 1.1 egories and Cond	High 1.2  Into Condition Cator estimating leng	each stream bank ach by measuring	urian areas along e	Scores  Delineate ripa Determine squ
CI	·	Cl= (Sum % RA * So Rt Bank Cl ⇒	Low 0.5 he sums ciparian qual 100 100%	comparable condition.  High  0.6  Ensure the of % R	with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High 0.85	Low 1.1 egories and Cond	High 1.2  Into Condition Cator estimating leng	each stream bank ach by measuring Score for each rips 100% 1.2	urian areas along e uare footage for ea tiparian Area and \$ % Riparian Area> Score >	Delineate ripa Determine squ Enter the % R Right Bank
CI 1.20	ores*0.01)/2 1.20 1.20	Cl= (Sum % RA * So Rt Bank Cl > Lt Bank Cl >	Low 0.5 he sums ciparian qual 100 100%	comparable condition.  High  0.6  Ensure the of % R	with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High 0.85	Low 1.1 egories and Cond	High 1.2  Into Condition Cator estimating leng	each stream bank ach by measuring Score for each rips 100% 1.2	urian areas along e uare footage for ea tiparian Area and s % Riparian Area>	Delineate ripa Determine squ Enter the % R
	1.20	Rt Bank CI >	Low 0.5 he sums tiparian qual 100 100%	comparable condition.  High  0.6  Ensure the of % R	with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	High 0.85  ition Scores using culators are provided and leafy debris;	Low 1.1 egories and Cond th and width. Calc he blocks below.  and depths; woody	High 1.2  Into Condition Cate or estimating leng arian category in the	each stream bank ach by measuring Score for each rips 100% 1.2 100% 1.2	wrian areas along e uare footage for ea tiparian Area and s % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Va	Delineate ripa Determine squ Enter the % R Right Bank Left Bank INSTREAN
	1.20	Rt Bank CI >	Low 0.5 he sums ciparian qual 100 100% 100%	comparable condition.  High  0.6  Ensure the of % R  Blocks ed	with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	High 0.85  ition Scores using culators are provided and leafy debris; all Category	Low 1.1 egories and Cond th and width. Calc he blocks below.  and depths; woody	High 1.2 Into Condition Cate or estimating leng arian category in the	ach stream bank ach by measuring Score for each rips 100% 1.2 100% 1.2 aried substrate size	wirian areas along e uare footage for ea tiparian Area and s % Riparian Area> Score >  % Riparian Area> Score >  // HABITAT: Va ; SAV; riffle poole	Delineate ripa Determine squ Enter the % R Right Bank Left Bank INSTREAN
	1.20	Rt Bank CI >	Low 0.5  he sums liparian qual 100 100%  100%  Is shade; undercut	comparable condition.  High  0.6  Ensure the of % R  Blocks ed  low embededness;	with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.  stable substrate; lateral substrate; lateral substrate in the carbon and are typically of the reach and are disintenance of	High 0.85  ition Scores using sulators are provided and leafy debris; al Category Mary Stable habitat eler	Low 1.1 egories and Cond th and width. Calc he blocks below.  and depths; woody Conditiona	High 1.2  Into Condition Cate or estimating leng arian category in the season of the s	each stream bank ach by measuring Score for each rips 100% 1.2 100% 1.2 aried substrate size complexes, stable	wian areas along e uare footage for ea uare footage for ea tiparian Area and s % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Va ; SAV; riffle poole Opt Habitat elements a	Delineate ripa Determine squ Enter the % R Right Bank Left Bank . INSTREAN anks; root mats;

	St	tream Ir	npact A	ssessm	ent For	m Page	2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02080104	06/22/2016	03STR-B17a	500	1
	ALTERATION: Stream crossin rictions, livestock	igs, riprap, concre			ightening of chanr	nel, channelization	, embankments,	NOTES>>Cu railroad cros	
	Negligible	Mi	nor	al Category Mod	erate	Sev	vere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of by any of the chan in the parameter g	of reach is disrupted nel alterations listed guidelines AND/OR lored with gabion, or cement.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH (	CONDITION	NDEX and S	TREAM CON	NDITION UNI	ITS FOR THI	S REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.26

0

RCI= (Sum of all CI's)/5

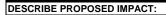
COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: View of stream north of CSX Bottom Right: View of stream, and culvert that carries stream under railroad



## NC DWQ Stream Identification Form Version 4.11 White Oak Run 03-STR-B-17a

Date: 06/24/2016	Project/Site: DC2RVA - Area 03	Latitude: 38.261412
Evaluator: L. Eggering, R. Mangum	County: Stafford	Longitude: -77.373628
<b>Total Points:</b> 40.5 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 24)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence				
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No	= 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 9)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes:	= 3
C. Biology (Subtotal = $\frac{7.5}{}$ )				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method	ds. See p. 35 of manual			
Notes: A double barrel concrete round culvert is I	ocated under railro	ad. Field Sheet:	: 21STR16 White O	ak Run.
		PTVEE IN	arienco.	
Sketch:		4	12-511-61	
			0-	
			2	
*		1	3	
		naga si		

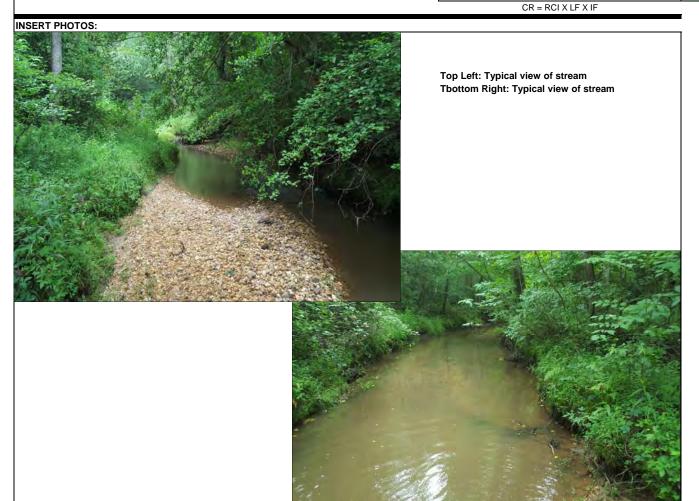
		Stre			sment Methodology f		-	n 1)			
					nels classified as						
Project #		Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	03b	VA	R2SB3	02080104	06/24/2016				
	e(s) of Evalua	•	Stream Name	e and Informa		D D 471					
	gering, R. M						) (White O	ak Run)			
I. Channel C	Condition: Asse	ess the cross-secti	on of the stream a		dition (erosion, age Conditional Categor						
	Opt	imal	Subo	ptimal	Mar	ginal	Po	or	Sev	rere	
		We have	Tu de la constant de			less than Severe or stable than Severe		ed/incised. unstable. Likely to	1	5	
Channel Condition	100% stable banks. protection or natur (80-100%). AND bars/bankfull ber Access to their or fully developed wic Mid-channel bars, few. Transient se	or active erosion; 80- Vegetative surface al rock, prominent b/OR Stable point ches are present. iginal floodplain or le bankfull benches. and transverse bars diment deposition 10% of bottom.	erosion or unproted of banks are sit Vegetative protect prominent (60- Depositional feat stability. The bar channels are well did has access to bat newly developed portions of the re- sediment covers 10	ew areas of active ted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow efined. Stream likely nkfull benches, or floodplains along reach. Transient 0-40% of the stream tom.	both banks. Vegetat 60% of banks. S bevertical or unde 60% of stream is c Sediment may be t contribute instabili contribute to s' forming/present. A channels have vege	esent on 40-60% of five protection on 40 freembanks may rout. AND/OR 40-overed by sediment. emporary/transient, ty. Deposition that tability, may be AND/OR V-shaped etative protection on sa and depositional	are near vertical. Ei 80% of banks. Ve present on 20-40' insufficient to preve 60-80% of the str sediment. temporary/transi contributing to inst shaped channels protection is prese	Sediment is ent in nature, and ability. AND/OR Value vegetative nt on > 40% of the diment deposition is	incision, flow con banks. Streambe rooting depth, m vertical/undercut. V present on less tha not preventing eros sloughing present. on 80-100%. ANI channel. Greater if	stability. Severe tatained within the ab below average tajority of banks egetative protection n 20% of banks, is ion. Obvious bank Erosion/raw banks D/OR Aggrading han 80% of stream by deposition,	
									thread channels ar flo		C
Score	;	3	2	.4	:	2	1	.6	1	l	2.
Riparian Buffers	Tree stratum (dbh: with > 60% tree c	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.	High Suboptimal:	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh	Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
			High	Low	High	Low	High	Low			
Condition Scores	1	.5	1.2	1.1	0.85	0.75	0.6	0.5			
Delineate ripa     Determine squ	arian areas along e uare footage for ea Riparian Area and S	ach by measuring	or estimating leng	th and width. Cal	_	·	of % F	he sums iparian qual 100			
Right Bank	% Riparian Area>	100%						100%			
g.ii. Daiik	Score >	1.2							CL_ (S;;;;;; 0/, D.A. * 0	cores*0.04\/2	
1.65	% Riparian Area>	100%						100%	CI= (Sum % RA * So Rt Bank CI >	1.20	С
Left Bank	Score >	1.2							Lt Bank CI >	1.20	1.2
	M HABITAT: Va			and depths; woody	y and leafy debris;	stable substrate;	low embededness	; shade; undercut	NOTES>>		
	, SAV, Tille poole	complexes, stable	reatures.	Condition	al Category						
banks; root mats				ptimal		ginal	Po	or			
Instream Habitat/ Available Cover	Habitat elements a	imal are typically present 50% of the reach.	Stable habitat eler present in 30-50% of adequate for r	ments are typically of the reach and are naintenance of ations.	present in 10-30%	naintenance of	lacking or are u	s listed above are instable. Habitat ally present in less f the reach.			•
Instream Habitat/ Available	Habitat elements a in greater than 5	are typically present	Stable habitat ele present in 30-50% o adequate for r popul	ments are typically of the reach and are maintenance of	present in 10-30% of adequate for no popula	of the reach and are naintenance of	lacking or are u elements are typic than 10% c	nstable. Habitat ally present in less			C 1.2

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Impact Factor CSX R2SB3 02080104 06/24/2016 03STR-B17b N/A VA 500 1 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, NOTES>> spoil piles, constrictions, livestock **Conditional Category** Moderate Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by any is disrupted by an of the channel Iterations listed in of the channel alterations listed in Less than 20% of the stream reach is 20-40% of the stream reach is Channel Greater than 80% of reach is disrupted the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. disrupted by any of the channel alterations listed in disrupted by any of the channel alterations listed in by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, Alteration guidelines. If auidelines. If stream has been stream has been channelized, channelized, the parameter the parameter riprap, or cement. normal stable normal stable guidelines. guidelines. stream meander pattern has not stream meander pattern has not recovered. SCORE 1.5 0.5 1.50 1.3 1.1 0.9 0.7 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 1.18 NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0



## NC DWQ Stream Identification Form Version 4.11 White Oak Run 03-STR-B-17b

Date: 06/24/2016	Project/Site: DC2RVA - Area 03	Latitude: 38.258494
Evaluator: L. Eggering, R. Mangum	County: Stafford	Longitude: -77.368594
<b>Total Points:</b> 41.5 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*	_p	IIII.COTA T GIGIIII	o.g. Quad Namo.		
A. Cooperate haloma (O. http:// 24	Absent	Weak	Moderate	Ctrong	
A. Geomorphology (Subtotal = 24 )				Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	1	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	(1.5)	
11. Second or greater order channel	No	= 0	Yes	= 3	
artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = 10 )					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	No	= 0	Yes:	= 3	
C. Biology (Subtotal = 7.5)	<u>.</u>				
18. Fibrous roots in streambed	3	2	1	0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	1	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0		
*perennial streams may also be identified using other meth	nods. See p. 35 of manual				

Sketch:

Notes: Field Sheet: 21 STR17 White Oak Run.

				perennial	intermittent or r	nels classified as	n wadeable chan	For use in			
	Impact Factor	Impact/SAR length	SAR#	Date	HUC	Cowardin Class.	Locality		Project Name	ı	Project #
	1			06/24/2016	02080104	R4SB	VA	03b	2RVA - Area (		N/A
				D_B_10	03-STI	tion	e and Informa	Stream Name		e(s) of Evaluate ering, R. Ma	
				(-D-10		dition (erosion, ago	and prevailing cond	on of the stream a		ondition: Asses	
	ere	Seve	oor	Po	, ,	Conditional Categor				Opti	
	5	1		1	5	1	~	Ž.	- W	1	
CI	stability. Severe talaned within the d below average ajority of banks egetative protection n 20% of banks, is ion. Obvious bank Erosion/raw banks D/OR Aggrading nan 80% of stream by deposition, stability. Multiple d/or subterranean	Deeply incised ( vertical/lateral ins incision, flow cont banks. Streambe- rooting depth, m- vertical/undercut. Ve- present on less than not preventing erosi sloughing present. on 80-100%. ANC channel. Greater th bed is covered contributing to ins thread channels an flow	unstable. Likely to jority of both banks rosion present on 60-getative protection % of banks, and is ent erosion. AND/OR eam is covered by Sediment is ent in nature, and ability. AND/OR V-s have vegetative ent on > 40% of the bidiment deposition is	are near vertical. En 80% of banks. Ver present on 20-409 insufficient to prever 60-80% of the stre sediment. S temporary/transic contributing to instal shaped channels protection is presen	stable than Severe wer bank slopes. seent on 40-60% of ive protection on 40-formathanks may rout. AND/OR 40-vered by sediment. semporary/transient, ty. Deposition that ability, may be ND/OR V-shaped tative protection on s and depositional	60% of banks. S bevertical or unde 60% of stream is co Sediment may be t contribute instabilit contribute to st forming/present. A	tion or natural rock 80%) AND/OR tures contribute to hkfull and low flow efined. Stream likely nkfull benches, or floodplains along reach. Transient 0-40% of the stream	erosion or unprotect of banks are st Vegetative protect prominent (60-Depositional feat stability. The ban channels are well de has access to ban newly developed portions of the r	Vegetative surface ral rock, prominent b/OR Stable point aches are present, iginal floodplain or le bankfull benches, and transverse bars diment deposition	Very little incision or 100% stable banks, protection or nature (80-100%). AND, bars/bankfull ben Access to their orij fully developed wide Mid-channel bars, a few. Transient sec covers less than	Channel Condition
		1	.6	1.	2	2	.4	2.	3	3	Score
		8.	eet: 21STR18 							BUFFERS: As	NOTES>> 2. RIPARIAN
		NOTES>>	oor	Po	ginal		nditional Cate		imal	Opti	
			Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	anopy cover and a derstory. Wetlands	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	Riparian Buffers
			Low	High 0.6	0.75	High 0.85	1.1	High 1.2	5	1.	Condition
			0.5							rian areas along ea	
			0.5 the sums Riparian equal 100	of % R	·	ŭ	th and width. Cal	or estimating lengi	Score for each ripa	iparian Area and S	Right Bank
	pores*0.01)/2	CI= (Sum % RA * Sc	the sums Riparian	of % R	·	ŭ	th and width. Cal		Score for each ripa	iparian Area and S	
CI 1 20	1.20	Rt Bank CI >	the sums Riparian	of % R	·	ŭ	th and width. Cal		100% 100%	iparian Area and S  % Riparian Area>  Score >  % Riparian Area>	
CI 1.20	1.20 1.20 ield sheet	Rt Bank CI > Lt Bank CI > NOTES>> Ephemeral f	the sums Riparian Riparian 100%	of % R Blocks e	ed for you below.	culators are provid	th and width. Calc ne blocks below.	arian category in the	100% 1.2 100% 1.2 ried substrate size	iparian Area and S % Riparian Area> Score >	Right Bank  Left Bank  B. INSTREAN
	1.20 1.20 ield sheet	Rt Bank CI > Lt Bank CI > NOTES>>	the sums Riparian Riparian 100%	of % R Blocks e	ed for you below.	culators are provid	th and width. Calc ne blocks below.	arian category in the category	100% 1.2 100% 1.2 rried substrate size complexes, stable	% Riparian Area Score >  % Riparian Area Score >  % Riparian Area Score >  1 HABITAT: Var	Right Bank  Left Bank  INSTREAN  anks; root mats:
	1.20 1.20 ield sheet	Rt Bank CI > Lt Bank CI > NOTES>> Ephemeral filled out - th	the sums  Riparian  equal 100  100%  100%  i; shade; undercut  boor  s listed above are nstable. Habitat allally present in less	of % R Blocks er  Bloc	stable substrate; I	v and leafy debris;	and depths; woody  Conditiona  ptimal  ments are typically of the reach and are maintenance of	es, water velocity a features.  Subol Stable habitat eler present in 30-50% of	100% 1.2 100% 1.2 100% 1.2 rried substrate size complexes, stable imal	% Riparian Area  % Riparian Area>  Score >  % Riparian Area>  Score >  1 HABITAT: Var.  SAV; riffle poole c	Right Bank  Left Bank  B. INSTREAN  anks; root mats;

Project # Applicant	Project # Applicant   Locality   Cowardin Class.   HUC   Date   Data Point   SAR length   Impact Factor		S	tream Ir	npact A	ssessm	nent For	m Page	2		
At CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock    Channel Alteration   Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.   Channelization alterations listed in the parameter guidelines.	A CHANNEL ALTERATION: Severe cosarings, riceae, concreve, packers, concreve blooks, straightering of trained, charmefulation, enthershireness, people jees, committee, packers, concreve places,	Project #			_					SAR length	Impact Factor
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock    Channel Alteration   Negligible   Minor   Moderate   40 - 60% of reach is disrupted by any of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.   40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.   40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.   40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.   40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.   40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.   40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.   40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.   40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.   40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.   40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.   40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.   40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.   40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.   40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.   40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.   40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines.   40 - 60% of reach	A CHANNEL ALTERATION: Stream crossings, repop, concess, gabons, or concessed bioles, strengtherms of converse, channel and stream of the control of the cont										
Channel Alteration  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  SCORE  1.5  1.3  1.1  0.9  Channelization, dredging, alteration is listed in the parameter guidelines.  SCORE  1.5  1.3  1.1  0.9  0.7  Conditional Category  Moderate  Severe  60-80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  SCORE  1.5  1.6  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  SCORE  1.5  1.3  1.1  0.9  0.7  Compensation Reach Conditional Category  Moderate  Severe  60-80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  SCORE  1.5  1.3  1.1  0.9  0.7  0.5   THE REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  CR = RCI X LF X IF	Negligible   Minor   Moderate   Severe	4. CHANNEL		ngs, riprap, concre							
Channel Alteration   Channel Zation, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.   Score	Channel Alteration Channel Channel Alteration Channel	spoil piles, consti	trictions, livestock		0 - 1121	al Cata					
Channel Alteration  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  SCORE  1.5  1.3  1.1  0.9  0.7  0.7  0.5   Compensation and RCI should be rounded to 2 decimal places. The CR should be rounded to 2 whole number.  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Less than 20% of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  SCORE  1.5  1.3  1.1  0.9  0.7  0.5   COMPENSATION REQUIREMENT (CR) >>  COMPENSATION REQUIREMENT (CR) >>  COMPENSATION REQUIREMENT (CR) >>  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	Channel Alteration Channel Alteration Channel		Negliaible	Mi			lerate	Ser	vere		
SCORE 1.5 1.3 1.1 0.9 0.7 0.5  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Sum of all CI's)/5  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The Ca and RCI should be recorded to 2 decimal places. The CR should be recorded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI: (Sum not all CI1s)/S  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  INSERT PHOTOS:		Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	Greater than 80% by any of the chan in the parameter 80% of banks sh	of reach is disrupted nel alterations listed juidelines AND/OR lored with gabion,		
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	INSERT PHOTOS:  THE REACH CONDITION INDEX (RCI) >  RCI= (Sum of all C1s) of COMPRATION REQUIREMENT (CR) >  COMPRATION REQUIREMENT (CR) >  CR = RCI X LF X IF  INSERT PHOTOS:	SCORE	1.5	1.3	1.1		1	0	.5		
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	INSERT PHOTOS:  THE REACH CONDITION INDEX (RCI) >  RCI= (Sum of all C1s) of COMPRATION REQUIREMENT (CR) >  COMPRATION REQUIREMENT (CR) >  CR = RCI X LF X IF  INSERT PHOTOS:										
RCI= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	RCIE (Sum of all CITS)/S  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  INSERT PHOTOS:	NOTE: The Cleand								CONDITION	NDEX (RCI) >>
COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  INSERT PHOTOS:	The CIS and R	Noi anoulu be rounded to 2 decimal piaces. Il	IN OR SHOULD BE FOUND	iou to a whole number						
CR = RCI X LF X IF	INSERT PHOTOS:									•	
	INSERT PHOTOS:							<u> </u>			, , , , ,
	DESCRIBE PROPOSED IMPACT:										

1

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 06/24/2016

03-STR-B-18

Evaluator: L. Eggering, R. Mangum  Fotal Points: 29.5  Stream is at least intermittent f ≥ 19 or perennial if ≥ 30*	Stream Determ Ephemeral Inte	ination (circle one) ermittent Perennial	Other e.g. Quad Name	
				_
A. Geomorphology (Subtotal = 15	Absent	Weak	Moderate	Strong
a. Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
S. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
3. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
0. Natural valley	0	0.5	1	1.5
1. Second or greater order channel	N	0 = 0	Yes	= 3
artificial ditches are not rated; see discussions in manual				
3. Hydrology (Subtotal = <u>7</u>				
2. Presence of Baseflow	0	1	2	3
3. Iron oxidizing bacteria	0	1	2	3
4. Leaf litter	1.5	1	0.5	0
5. Sediment on plants or debris	0	0.5	1	1.5
6. Organic debris lines or piles	0	0.5	① _	1.5
7. Soil-based evidence of high water table?	N	0 = 0	Yes	= 3
C. Biology (Subtotal = $\frac{7.5}{}$ )				
8. Fibrous roots in streambed	3	2	1	0
Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks		1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other =	0
*perennial streams may also be identified using other met	•	al.		
Notes: Inundated at pool/hole. Field Sheet: 215	STR18.			

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Cowardin Impact Project # **Project Name** SAR# Locality HUC Date Class length **Factor** N/A DC2RVA - Area 03b ۷A 02080104 07/6/2016 Name(s) of Evaluator(s) Stream Name and Information L. Eggering, R. Mangum 03-STR-B-19 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Dirt/gravel road at Suboptimal Marginal Poor Low Marginal: edge. 21-STR-21 High Poor: ow Suboptima Non-maintained High Suboptima Riparian areas Lawns, mowed Riparian areas with tree stratum (dbh > 3 inches) High Marginal: Non-maintained, dense herbaceou nse herbace and maintained areas, nurseries Low Poor: Impervious vegetation, with tree stratum riparian areas (dbh > 3 inches) present, with 30% to 60% tree no-till cropland: surfaces, mine lacking shrub and tree stratum, hay production, ponds, present, with vegetation with Tree stratum (dbh > 3 inches) presen with > 60% tree canopy cover and ar non-maintained understory. Wetland actively grazed pasture, sparsely vegetated nonspoil lands. either a shrub layer or a tree layer (dbh > 3 Riparian 30% tree canop cover and a uded surfac Buffers anopy cover an row crops, active maintained open water. If containing both herbaceous and shrub layers or a areas. maintained area eed lots, trails, or understory. Recent cutove inches) present, with <30% tree present, tree stratum (dbh >3 recently seeded and stabilized, or ther comparable (dense canopy cover. inches) present non-maintained other comparable vegetation). with <30% tree understory. condition. anopy cover with maintained understory High Low High Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums escriptors. . Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below % Riparian Area> 50% 50% 100% Right Bank 1.2 0.6 CI= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> CI 100% 100% Rt Bank CI > Left Bank 1.2 Lt Bank CI > 1.20 1.05 Score > REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >: 0.53 NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to 2 decimal places. RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> 0

**INSERT PHOTOS:** 



Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 7/6/2016

03-STR-B-19

Weak  1  1  1  1  1  1  1  1  1  1  1  1  1		Strong  3 3 3 3 3 3 3 1.5 1.5 1.5 3
Weak  1  1  1  1  1  1  1  1  0.5  No = 0	Moderate  2 2 2 2 2 2 2 1 1 1 Yes:	Strong  3 3 3 3 3 3 3 1.5 1.5 1.5 3
1 1 1 1 1 1 1 0.5 0.5 No = 0	2 2 2 2 2 2 2 2 1 1 1 Yes =	3 3 3 3 3 3 3 1.5 1.5 1.5 3
1 1 1 1 1 1 1 0.5 0.5 No = 0	2 2 2 2 2 2 2 2 1 1 1 Yes =	3 3 3 3 3 3 3 1.5 1.5 1.5 3
1 1 1 1 1 0.5 0.5 No = 0	2 2 2 2 2 2 2 1 1 1 Yes =	3 3 3 3 3 3 1.5 1.5 2 3 3 3
1 1 1 1 1 1 0.5 No = 0	2 2 2 2 2 2 1 1 1 Yes =	3 3 3 3 3 1.5 1.5 3 3 3
1 1 1 0.5 0.5 No = 0	2 2 2 2 1 1 Yes:	3 3 3 1.5 1.5 = 3
1 1 1 0.5 0.5 No = 0	2 2 2 1 1 Yes =	3 3 3 1.5 1.5 1.5 3
1 0.5 0.5 No = 0	2 2 1 1 Yes :	3 3 1.5 1.5 1.5 3 3
(1) (0.5) No = 0	2 1 1 Yes :	3 1.5 1.5 = 3
0.5 0.5 No = 0	1 1 Yes :	1.5 1.5 = 3
0.5 No = 0	1 Yes :	1.5 = 3 3 3
No = 0	Yes : 2 2	3 3
	2 2	3
	2	3
	2	3
	2	3
	0.5	0
1	0.5	0
0.5	1	1.5
0.5	1	1.5
No = 0	Yes :	= 3
2	1	0
2	1	0
1	2	3
1	2	3
0.5	1	1.5
0.5	1	1.5
0.5	1	1.5
0.5	1	1.5
FACW = 0.75; O	BL = 1.5 Other = 0	
ual		
uaı.		
-	0.5 0.5 FACW = 0.75; O	0.5 1 0.5 1 FACW = 0.75; OBL = 1.5 Other = 0

				perennial	intermittent or p		n wadeable chan	For use in			
ļ	Impact Factor	Impact/SAR length	SAR#	Date	HUC	Cowardin Class.	Locality		Project Name	I	Project #
				07/6/2016	02080104	R1	VA		2RVA - Area (		N/A
		`	ock Piver	appahanno	R-20 (P:		e and Informa	Stream Name		e(s) of Evaluat ering, R. Ma	
ļ		)	ock ivivei	аррананн				on of the stream a		ondition: Asses	
	ere	Sev	or	Po		Conditional Categor				Opti	
	<b>5</b>			Overwidene	5	Often incised, but I	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	1	صويد المحلا		
CI	stability. Severe tained within the d below average ajority of banks agetative protection n 20% of banks, is on. Obvious bank Erosion/raw banks o/OR Aggrading ana 80% of stream by deposition, stability. Multiple d/or subterranean	Deeply incised (vertical/lateral ins incision, flow cont banks. Streamber rooting depth, wertical/undercut. Vertical/undercut. Vertical/undercut. Vertical/undercut. Vertical/undercut. Vertical/undercut. Vertical/undercut. Vertical/undercut. Vertical/undercut. Vertical/undercut. On 80-100%. AND. Creater the bed is covered contributing to ins thread channels and flow	ority of both banks osion present on 60- getative protection  & of banks, and is  nt erosion. AND/OR  sam is covered by  Sediment is  ent in nature, and  ability. AND/OR V- have vegetative  nt on > 40% of the  diment deposition is	Vertically/laterally viden further. Majare near vertical. Erc 80% of banks. Veg present on 20-40% insufficient to prever 60-80% of the stre sediment. S temporary/transie contributing to insta shaped channels protection is preser banks and stable sec abse	wer bank slopes, expensive for the thing the protection on 40-60% of treambanks may recut. AND/OR 40-wered by sediment, emporany/transient, ty, Deposition that ability, may be NND/OR V-shaped stative protection on s and depositional	60% of banks. S bevertical or unde 60% of stream is co Sediment may be t contribute instabili contribute to st forming/present. A	tion or natural rock 80%) AND/OR ures contribute to hkfull and low flow efined. Stream likely nkfull benches, or floodplains along each. Transient 0-40% of the stream	erosion or unprotec of banks are st Vegetative protect prominent (60- Depositional featu stability. The ban channels are well de has access to ban newly developed	Vegetative surface al rock, prominent //OR Stable point ches are present. ginal floodplain or e bankfull benches. and transverse bars diment deposition	Very little incision or 100% stable banks. protection or natura (80-100%). AND bars/bankfull ben Access to their ori fully developed wid Mid-channel bars, a few. Transient sec covers less than	Channel Condition
3.0		1	6	1.	2		.4	2.	3	3	Score
		NOTES>>		Po	ginal	gory	ditional Cate			Opti	. RIPARIAN
			Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	tree stratum (dbb - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	anopy cover and a derstory. Wetlands	Optimal  Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	
			Low	High	Low	High	Low	High	_		Condition
			0.5	0.6	0.75	0.85	1.1	1.2	.5	1.	Scores
			iparian qual 100	Ensure the of % Ri	·	, and a	th and width. Cald	or estimating lengt	nch by measuring	rian areas along ea uare footage for ea iparian Area and S	. Determine squ
			100%						100% 1.5	% Riparian Area>	Right Bank
		CI= (Sum % RA * Sc									
CI 1.50	1.50 1.50	Rt Bank CI >	100%						100% 1.5	% Riparian Area>	Left Bank
			shade; undercut	ow embededness;	stable substrate; l				ried substrate size	<b>I HABITAT:</b> Var ; SAV; riffle poole o	
	to silty	substrate. G		Po	ginal	al Category Marg	Conditiona ptimal	Subo	imal	Opti	Instream
	Good		or					-		_	Habitat/
CI	Good ent. Leafy	canopy pres and woody o present.	listed above are estable. Habitat ally present in less	Habitat elements lacking or are un elements are typica than 10% of	naintenance of	Stable habitat eler present in 10-30% of adequate for n popula	of the reach and are maintenance of			Habitat elements an in greater than 50	Available Cover

N/A CSX VA R1 02080104 07/6/2016 03-STR-B20 500 1  4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock    Conditional Category   Negligible   Minor   Moderate   Severe	Stream Impact Assessment Form Page 2											
Alteration  Channel Alteration  Channelization, dredging, alteration, or hardening absent. Stream has ben unaltered pattern or has naturalized.  Channelization alterations listed in the parameter guidelines.  Channelization alterations listed in the parameter guidelines.  Channelization, dredging, alterations listed in the parameter guidelines.  Channelization alterations listed in the parameter guidelines.  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has been channelized, normal stable stream meander pattern has not recovered.  Channelization, dredging, alteration, or defined the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor		
Channel Alteration  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelized in the parameter guidelines.  Channelized in the parameter guidelines.  Channelized in the parameter guidelines.  Channelized in the parameter guidelines.  Channelized in the parameter guidelines.  Channelized in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  Channelized in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	N/A	CSX		VA	R1	02080104	07/6/2016	03-STR-B20	500	1		
Channel Alteration  Channelization, dredging, alteration, or hardening absent. Stream has a unaltered pattern or has naturalized.  Channelization or has naturalized.  Channelization or has naturalized.  Channelization or has naturalized.  Channelization or has naturalized.  Channelization or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has a unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has a unalterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  Channelization, dredging, alteration, or hardening absent. Stream has a unalterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  Channelization, dredging, alteration, or district the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	spoil piles, constrictions, livestock  Conditional Category											
Channel Alteration  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern has not recovered.  Channelization, dredging, alteration, or the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  Stream has been channelized, normal stable stream meander pattern has not recovered.		Negligible Minor Moderate Severe										
SCORE 15 13 11 09 07 05		hardening absent. Stream has an	the stream reach is disrupted by any of the channel alterations listed in the parameter	stream reach is disrupted by any of the channel alterations listed in the parameter	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	Greater than 80% of by any of the chan in the parameter g	nel alterations listed guidelines AND/OR nored with gabion,				
3.5 0.7 0.5	SCORE	1.5	1.3	1.1	0.9	0.7	0	.5				

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

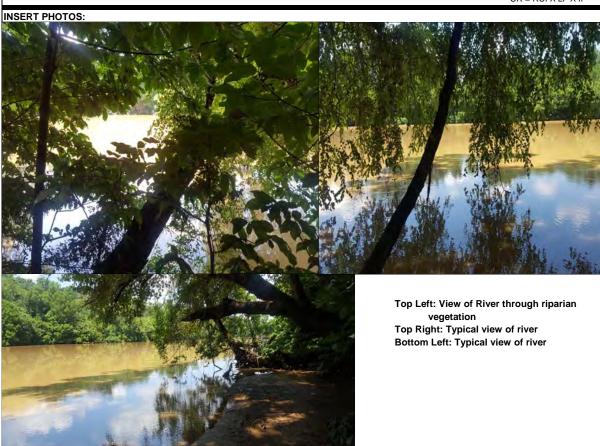
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.50

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF



Rappahannock River 03-STR-B-20 NC DWQ Stream Identification Form Version 4.11 Project/Site: DC2RVA - Area 03 Date: 7/6/2016 Latitude: 38,244075 Evaluator: L. Eggering, R. Mangum County: Stafford Longitude: -77.365663 Total Points: 61 Stream Determination (circle one) Other Stream is at least intermittent Ephemeral Intermittent Perennial e.g. Quad Name: if ≥ 19 or perennial if ≥ 30\* **Absent** Weak Moderate Strong A. Geomorphology (Subtotal = 301<sup>a.</sup> Continuity of channel bed and bank 3 0 2 2. Sinuosity of channel along thalweg 0 1 2 3 3. In-channel structure: ex. riffle-pool, step-pool, 0 2 1 ripple-pool sequence 4. Particle size of stream substrate 2 0 1 5. Active/relict floodplain 0 2 3 1 3 6. Depositional bars or benches 0 1 2 3 7. Recent alluvial deposits 0 2 1 2 3 8. Headcuts 0 1 9. Grade control 0 0.5 1 10. Natural valley 0 0.5 11. Second or greater order channel No = 0Yes = 3 artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 1312. Presence of Baseflow 2 0 1 13. Iron oxidizing bacteria 0 2 1 14. Leaf litter 1.5  $\bigcirc$ 0.5 15. Sediment on plants or debris 0 0.5 1 16. Organic debris lines or piles 0 0.5 1 17. Soil-based evidence of high water table? No = 0Yes = 3C. Biology (Subtotal = 18 18. Fibrous roots in streambed 2 3 19. Rooted upland plants in streambed 2 0 1 20. Macrobenthos (note diversity and abundance) 2 3 0 1 21. Aquatic Mollusks 0 1 2 3 22. Fish 0 0.5 1 23. Crayfish 0 0.5 1 24. Amphibians 0 0.5 1 25. Algae 0 0.5 FACW = 0.75; OBL = 1.5 Other = 0 26. Wetland plants in streambed \*perennial streams may also be identified using other methods. See p. 35 of manual. Notes: This is the Rappahannock River, Virginia rye grass, an early-season grass, is present along the bank (Danthonia sericea & Elymus virginicus) 21-STR-20 Sketch: flow

		Stre			sment		-	n 1)		
					nels classified a					
Project #		Project Name	)	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC	2RVA - Area	03b	VA	R4SB	02080104	07/6/2016			
	e(s) of Evalua	•	Stream Name	e and Informa	ition	00 OT	D D 04			
	gering, R. Ma						R-B-21			
. Channel C	Condition: Asse	ss the cross-sect	on of the stream a		dition (erosion, age					
	Opt	imal	Subo	ptimal		ginal	Po	oor	Sev	ere
Channel Condition		Vegetative surface	erosion or unprote of banks are s Vegetative protect	ew areas of active ted banks. Majority table (60-80%). tion or natural rock	Poor. Banks more or Poor due to lo Erosion may be pr both banks. Vegeta 60% of banks. S	less than Severe or stable than Severe wer bank slopes. esent on 40-60% of tive protection on 40 streambanks may	Vertically/laterally widen further. Ma are near vertical. E 80% of banks. Ve present on 20-40	ned/incised. unstable. Likely to jority of both banks rosion present on 60 regetative protection % of banks, and is	incision, flow con banks. Streambe	stability. Severe tained within the
	(80-100%). AND bars/bankfull ben Access to their ori fully developed wid Mid-channel bars, a	ginal floodplain or e bankfull benches. and transverse bars diment deposition	Depositional feat stability. The bat channels are well d has access to bat newly developed portions of the sediment covers 10	-80%) AND/OR tures contribute to hkfull and low flow fined. Stream likely hkfull benches, or floodplains along each. Transient 3-40% of the stream tom.	60% of stream is or Sediment may be to contribute instabil contribute to so forming/present. / channels have veg > 40% of the bank	ercut. AND/OR 40- powered by sediment. temporary/transient, ity. Deposition that tability, may be AND/OR V-shaped etative protection on ss and depositional ntribute to stability.	insufficient to preve 60-80% of the str sediment. temporary/transi contributing to inst shaped channels protection is prese banks and stable se	ant erosion. AND/OR eam is covered by Sediment is ent in nature, and ability. AND/OR V-s have vegetative ent on > 40% of the ediment deposition is sent.	rooting depth, m vertical/undercut. V present on less tha not preventing eros sloughing present. on 80-100%. ANI channel. Greater th	ajority of banks egetative protection n 20% of banks, is ion. Obvious bank Erosion/raw banks D/OR Aggrading nan 80% of stream by deposition, stability. Multiple td/or subterranean
Score	3	3	2	.4	:	2	1	.6	1	
. RIPARIAN	N BUFFERS: A		Cor	areas along the enditional Cate	gory	measurements o		ay be acceptable)	NOTES>>	
Riparian Buffers	Optimal  Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and a non-maintained understory. Wetland located within the riparian areas.		High Suboptimal:	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh	Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrub and tree stratum, hay production,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		
			High	Low	High	Low	High	Low		
Condition Scores	1.	5	1.2	1.1	0.85	0.75	0.6	0.5		
2. Determine sq	arian areas along e quare footage for ea Riparian Area and S	ch by measuring	or estimating leng	th and width. Cal	•	•	of % F	the sums Riparian equal 100		
Right Bank	% Riparian Area>	100% 0.85						100%		
	1								CI= (Sum % RA * So	cores*0.01)/2
	% Riparian Area>	100%						100%	Rt Bank CI >	0.85
Left Bank		0.85							Lt Bank CI >	0.85
	Score >			and depths; wood	y and leafy debris;	stable substrate;	low embededness	; shade; undercut	INUTES>>	
B. INSTREAM	Score >  M HABITAT: Va s; SAV; riffle poole of									
3. INSTREAM panks; root mats	M HABITAT: Va s; SAV; riffle poole o	complexes, stable	features.	Condition	al Category	einel .				
3. INSTREAM	M HABITAT: Va s; SAV; riffle poole o	complexes, stable	Stable habitat ele present in 30-50% adequate for i		Stable habitat ele present in 10-30% adequate for r	ginal ments are typically of the reach and are maintenance of ations.	Habitat elements lacking or are u elements are typic	s listed above are nstable. Habitat ally present in less of the reach.		
3. INSTREAM panks; root mats Instream Habitat/ Available	M HABITAT: Va s; SAV; riffle poole o Opt	imal re typically present 0% of the reach.	Stable habitat ele present in 30-50% adequate for i	Conditional ptimal ments are typically of the reach and are maintenance of	Stable habitat ele present in 10-30% adequate for r popul	ments are typically of the reach and are maintenance of	Habitat elements lacking or are u elements are typic than 10% o	s listed above are nstable. Habitat cally present in less		

	S	tream Ir	npact A	ssessm	ent For	m Page	2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB	02080104	07/6/2016	03-STR-B21	500	1
	_ ALTERATION: Stream crossin rictions, livestock	ngs, riprap, concre		ncrete blocks, strai	ightening of chanr	nel, channelization	n, embankments,	NOTES>> This is a str potentially i	-
	Negligible	Mi	nor		erate	Se	vere	channel.	,
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% by any of the chan in the parameter 80% of banks sh	of reach is disrupted nel alterations listed guidelines AND/OR lored with gabion, or cement.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	).5		
	REACH (	CONDITION	NDEX and S	TREAM CON	NDITION UNI	ITS FOR THI	S REACH		
OTE: The CIs and R	RCI should be rounded to 2 decimal places. The	he CR should be round	ed to a whole number.				THE REACH	CONDITION IN	DEX (RCI) >>
						L	DC.	I_ (Sum of all C	'c\/E

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF



NC DWQ Stream Identification Form Version 4.11

### 03-STR-B-21

Date: 7/6/2016	Project/Site: DC2RVA - Area 03	Latitude: 38.240389
Evaluator: L. Eggering, R. Mangum	County: Caroline	Longitude: -77.367548
<b>Total Points:</b> 33 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 15.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-poor ripple-pool sequence	ol, O	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel		0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in m	anual			
B. Hydrology (Subtotal = $8.5$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1)	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	= 3
C. Biology (Subtotal = 9				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75,	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other		al.		
Notes: Rushes are growing in the stream	channel. 21-STR-22			
Cleatala		7	A	
Sketch:	field	1		
3	- \	Culvert - M	41	
504	Field			
ò	Maring - parts		4	
	feld N		]	
	1			
	-			

#### Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia For use in wadeable channels classified as intermittent or perennial Impact/SAR Cowardin Impact Project # HUC SAR# **Project Name** Locality Date Class length Factor DC2RVA - Area 03b ۷A R2SB3 02080104 07/7/2016 Stream Name and Information Name(s) of Evaluator(s) 03-STR-B-22 (Tributary to Snow Creek) L. Eggering, R. Mangum 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Optimal Severe Suboptimal Marginal Poor Often incised, but less than Severe o Overwidened/incised Poor Banks more stable than Severe Vertically/laterally unstable. Likely to widen further. Majority of both banks or Poor due to lower bank slopes osion or unprotected banks. Majority Erosion may be present on 40-60% of re near vertical. Erosion present on 60 vertical/lateral instability. Severe Channel Very little incision or active erosion; 80 of banks are stable (60-80%) oth banks. Vegetative protection on 40 60% of banks. Streambanks may 80% of banks. Vegetative protection incision, flow contained within the 100% stable banks. Vegetative surface protection or natural rock, prominent getative protection or natural rock prominent (60-80%) AND/OR Condition present on 20-40% of banks banks. Streambed below average sufficient to prevent erosion. AND/OR bevertical or undercut. AND/OR 40rooting depth, majority of banks Depositional features contribute to (80-100%). AND/OR Stable point rertical/undercut. Vegetative protection present on less than 20% of banks, is 60% of stream is covered by sediment 60-80% of the stream is covered by stability. The bankfull and low flow nannels are well defined. Stream likel bars/bankfull benches are present Sediment may be temporary/transient contribute instability. Deposition that sediment. Sediment is Access to their original floodplain or temporary/transient in nature, and not preventing erosion. Obvious bank fully developed wide bankfull benches has access to bankfull benches, or sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading contribute to stability, may be contributing to instability. AND/OR V-Mid-channel bars, and transverse bars few. Transient sediment deposition newly developed floodplains along portions of the reach. Transient diment covers 10-40% of the stream shaped channels have vegetative protection is present on > 40% of the forming/present. AND/OR V-shaped channels have vegetative protection o channel. Greater than 80% of stream covers less than 10% of bottom. bed is covered by deposition, contributing to instability. Multiple > 40% of the banks and depositional anks and stable sediment deposition is bottom features which contribute to stability thread channels and/or subterranean flow. CI Score 3 2.4 2 1.6 2.0 NOTES>> 21-STR-23 (Tributary to Snow Creek) 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> The left bank of this Optimal Marginal Suboptimal stream is eroded. Low Marginal: ligh Poor: Lawn Non-maintained. mowed, and **High Suboptimal** Low Suboptimal lense herbaceo High Marginal: aintained areas Low Poor Riparian areas with tree stratum (dbh > Riparian areas with Non-maintained nurseries; no-till egetation, riparia Impervious ee stratum (dbh dense herbaceous reas lacking shru cropland; actively surfaces, mine 3 inches) present, 3 inches) present vegetation with ther a shrub lay grazed pasture, parsely vegetate spoil lands, nuded surface Tree stratum (dbh > 3 inches) present and tree stratum Riparian with 30% to 60% tree canopy cover with > 30% tree with > 60% tree canopy cover and a non-maintained understory. Wetlands hay production canopy cover and **Buffers** or a tree layer (dbh onds, open wate non-maintained row crops, active and containing bot a maintained > 3 inches) present, with <30% If present, tree stratum (dbh >3 located within the riparian areas. area, recently feed lots, trails, or herbaceous and shrub layers or a nderstory. Rece cutover (dense stabilized, or other conditions. ree canopy cover inches) present. non-maintained vegetation). with <30% tree comparable understory canopy cover wit maintained condition. understory High Low Hiah Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank CI= (Sum % RA \* Scores\*0.01)/2 100% 100% Rt Bank CI > 1.20 CI % Riparian Area> Left Bank 1.20 1.20 It Bank CI > 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut NOTES>> anks; root mats; SAV; riffle poole complexes, stable features Conditional Category Optimal Suboptimal Marginal Instream Poor Habitat/ Stable habitat elements are typically Stable habitat elements are typically Habitat elements listed above are Available present in 30-50% of the reach and are adequate for maintenance of present in 10-30% of the reach and a adequate for maintenance of lacking or are unstable. Habitat elements are typically present in less Habitat elements are typically present Cover in greater than 50% of the reach. populations. populations. than 10% of the reach. CI Score 1.5 1.2 0.9 0.5 1.20

	St	tream In	npact A	ssessm	ent For	m Page	2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2SB3	02080104	07/7/2016	03-STR-B22	500	1	
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock  Conditional Category  NOTES>> This is a straight, potentially man-made,										
	Negligible Mi		Minor		lerate	Se	vere	channel.	man-made,	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.		60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	by any of the chan in the parameter 80% of banks sl	of reach is disrupted inel alterations listed guidelines AND/OR nored with gabion, or cement.	onamic.		
SCORE	1.5	1.3	1.1	0.9	0.7	C	).5			
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH										

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.18

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF



Left: Typical view of stream

Right: Typical view of stream

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 7/7/2016

03-STR-B-22

Evaluator: L. Eggering, R. Mangum	County: Carolin	е	Longitude: -77	7.370985
<b>Total Points:</b> 41.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle on rmitten Perenn		
A. Geomorphology (Subtotal = 22)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	<u>'</u> 1	2	3
In-channel structure: ex. riffle-pool, step-pool,	-			
ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2)	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	2)	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No	0 = 0	Yes	
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $10$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2)	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	0.5	0.5	1.5
16. Organic debris lines or piles	0	0.5	(1) _	1.5
17. Soil-based evidence of high water table?		0.5	Yes	
C. Biology (Subtotal = 9.5	140	<i>y</i> = 0	103	
18. Fibrous roots in streambed	(3)	2	1	0
Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)		1	2	3
21. Aquatic Mollusks		<u>'</u> 1	2	3
22. Fish	0	0.5	1	1.5
	0	0.5	(1)	1.5
23. Crayfish	0			
24. Amphibians	Ö	0.5	1	1.5
25. Algae		0.5	ODI 15 Othor (	1.5
26. Wetland plants in streambed	-d- C 25 of		OBL = 1.5 Other = 0	<u> </u>
*perennial streams may also be identified using other meth Notes: This is a tributary to Snow Creek. 21-STI		l		
Notes. This is a tributary to Show Creek. 21-311	X-23			
_	Prospert Livi	•		
Sketch:	Prospect Hil	I Road		
		_ \		
$\leftarrow$				
<u> </u>				

	Epher	mera				ment		(For	m 1a)	
Project #	Pr	roject Name			e in ephemeral s		Date	SAR#	Impact/SAR length	Impact
N/A	DC2F	RVA - Area	03b	VA	Class. R6	02080104	07/7/2016		length	Factor 1
-	e(s) of Evaluato			e and Informa		32330.04	52010			
L. Egg	ering, R. Maı	ngum				03-STI	R-B-23			
2. RIPARIAN	N BUFFERS: Ass	sess hoth hank	's 100 foot riparia	n areas along the	e entire SAR (ro	ugh measuremen	ts of length & widt	h may be accept	able)	
			•	ditional Cate	•	-9	· · · · · · · · · · · · · · · · ·	,	NOTES>>	
	Optim	ıal	Subo	ptimal	Mar	ginal	Po	oor	This Field s	
Riparian Buffers	Tree stratum (dbh > 3 with > 60% tree cano non-maintained under areas	py cover and an rstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory: Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	row crops, active feed lots trails or	missing, so Sheet 21-ST used for the connects w stream. No National Hy Database.	R-24 was data, it th this line in
Condition	1.5		1.2	1.1	0.85	0.75	0.6	0.5	1	
descriptors.  2. Determine squeelow.	quare footage for eac Riparian Area and So % Riparian Area> Score >	ch by measurin	g or estimating le	ngth and width. (	Calculators are pr	· ·	of % F	the sums Riparian qual 100 100%		
	33333	•••	0.0						CI= (Sum % RA * S	cores*0.01)/2
Left Bank	% Riparian Area>	100%						100%	Rt Bank CI >	0.98 1.20
	Score >			NDEV and S	TDEAM CO	NDITION UN	ITS EOD TH	IS DEACH	Et Balik Ol >	1.20
NOTE: The Cls and F	RCI should be rounded to					INDITION ON			CONDITION IND	EX (RCI) >>
		•						F	RCI= (Riparian C	I)/2
									ON REQUIREM IXLFXIF	ENT (CR) >>
INSERT PHO										
DESCRIBE F	PROPOSED IMF	PACT:								

Project/Site: DC2RVA-Segment 21

NC DWQ Stream Identification Form Version 4.11

Date: 7/7/2016

03-STR-B-23

Evaluator: L. Eggering, R. Mangum	County: Carolin	ne	Longitude: -77.371297		
<b>Total Points:</b> 15.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determ Ephemeral	ination (circle one) ermittent Perennial	Other e.g. Quad Name:	:	
A. Geomorphology (Subtotal = 11.5	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
Sinuosity of channel along thalweg	0	(1)	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	N	0 = 0	Yes:	= 3	
<sup>a</sup> artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = 1				T	
12. Presence of Baseflow		1	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	= 3	
C. Biology (Subtotal = 3)					
18. Fibrous roots in streambed	3	2	1	0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	1	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5		1.5	
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0		
*perennial streams may also be identified using other methods			. 20 0		
Notes: This Field sheet is missing, so Field Sheet	21-51K-24 was i	used for the data, it	connects with th	is stream. No	
line in National Hydrography Database.					
Sketch:					
- Cholon					

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Impact Cowardin Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 03b ۷A 02080104 07/7/2016 R6 Name(s) of Evaluator(s) Stream Name and Information 03-STR-B-24 L. Eggering, R. Mangum 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor This is an inlet at the Low Marginal: Non-maintained edge of an agricultural High Poor: Lawns, mowed High Suboptim field. It becomes a Riparian areas High Marginal nse herbace Low Poor: Riparian areas and maintained with tree stratum (dbh > 3 inches) present, with maintained vegetation, Impervious surfaces, mine spoil lands, deeply incised stream with tree stratum (dbh > 3 inches) riparian areas acking shrub and no-till cropland; channel. 21-STR-24 vegetation with ree stratum (dbh > 3 inches) preser resent, with 30% actively grazed Riparian 30% tree canon either a shrub tree stratum, hay pasture, sparsely vegetated non-maintained area, with > 60% tree canopy cover non-maintained understory. W Tributary to Snow to 60% tree nuded surfaces layer or a tree layer (dbh > 3 oduction, ponds open water. If ory. Wetland canopy cover and containing both row crops, active feed lots, trails, or **Buffers** Creek areas present, tree understory inches) present herbaceous and recently seeded other comparable Recent cutover with <30% tree stratum (dbh >3 shrub layers or a non-maintained understory. and stabilized, or conditions. (dense vegetation). canopy cover inches) present with <30% tree anopy cover wit maintained High Low High Low High Low Condition 0.5 1.5 1.2 1.1 0.85 0.75 0.6 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums escriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 80% 20% 100% Right Bank 0.5 CI= (Sum % RA \* Scores\*0.01)/2 100% 100% Rt Bank Cl > CI % Riparian Area> 0.98 Left Bank 1.09 1.2 Lt Bank CI > 1.20 Score > REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number. THE REACH CONDITION INDEX (RCI) 0.55 RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF INSERT PHOTOS: Left: Typical view of stream channel Middle: Typical view of stream channel Right: Typical view of stream channel DESCRIBE PROPOSED IMPACT:

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 7/7/2016

03-STR-B-24

Evaluator: L. Eggering, R. Mangum	County: Carolin	е	Longitude: -77	.372501
<b>Total Points:</b> 15.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	
A 0	Allegard	M/1	Ma lauria	01
A. Geomorphology (Subtotal = 11.5)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0		2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes =	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 1				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes =	= 3
C. Biology (Subtotal = 3				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians		0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OBI	_ = 1.5 Other = 0	
*perennial streams may also be identified using other method	ds. See p. 35 of manua	l.		
Notes: The pond adjacent to drainage excavated	out beside agricult	ural field deeply inc	cised channel, no	o water.
21-STR-24				
Sketch:	≥ ho	deeply of *	Louis He	

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Impact Cowardin Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 03b ۷A 02080104 07/8/2016 R6 Name(s) of Evaluator(s) Stream Name and Information 03-STR-B-25 L. Eggering, R. Mangum 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor This is a stream the Low Marginal: Non-maintained, flows to a pond. 21-High Poor: ow Suboptima ligh Suboptima awns, mowed STR-25 High Marginal: Riparian areas ense herbaceo Low Poor: and maintained vegetation, riparian areas acking shrub and with tree stratum Impervious surfaces, mine spoil lands, with tree stratun areas, nurseries (dbh > 3 inches) present, with (dbh > 3 inches) no-till cropland vegetation with Free stratum (dbh > 3 inches) preser resent, with 30% to 60% tree actively grazed Riparian 30% tree canop either a shrub tree stratum, hay pasture, sparsely vegetated non-maintained area, with > 60% tree canopy cover and ar non-maintained understory. Wetland enuded surfaces cover and a maintained layer or a tree layer (dbh > 3 open water. If present, tree canopy cover and containing both row crops, active eed lots, trails, or **Buffers** understory inches) present, ther comparable herbaceous and recently seeded Recent cutove with <30% tree stratum (dbh >3 shrub layers or a non-maintained and stabilized, o conditions. (dense vegetation) canopy cover. inches) present with <30% tree understory anopy cover with maintained understory. High Low High Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numb

1.2

100%

1.2

THE REACH CONDITION INDEX (RCI) >> 0.60 RCI= (Riparian CI)/2

Rt Bank CI >

Lt Bank CI >

CI= (Sum % RA \* Scores\*0.01)/2

1.20

1.20

CI

1.20

0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

100%

#### **INSERT PHOTOS**

Left Bank

Score >

% Riparian Area>



View of stream connection to pond

NC DWQ Stream Identification Form Version 4.11

03-STR-B-25

Date: 7/8/2016	Project/Site: DC2RVA - Area 03	Latitude: 38.215148
Evaluator: L. Eggering, R. Mangum	County: Caroline	Longitude: -77.386763
<b>Total Points:</b> 14 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral ntermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 7.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches		1	2	3
7. Recent alluvial deposits		1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual			•	
B. Hydrology (Subtotal = $1.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = $5$				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	11	1.5
26. Wetland plants in streambed			OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method		al.		
Notes: No meanders. Deposits into pond. 21-STF	₹-25			
Sketch:				
Pond	No water	in channel		$\triangleright$
				$\forall$
	_			

### **Ephemeral Stream Assessment Form (Form 1a)**

Unified Stream Methodology for use in Virginia

		For us	e in ephemeral s	treams				
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Area 03b	VA	R6	02080104	07/8/2016			1

Name(s) of Evaluator(s) Stream Name and Information

03-STR-B-26 L. Eggering, R. Mangum

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Con	ditional Cate	gory				NOTES>>		
	Optimal	Subo	ptimal	Mar	ginal	Po	oor	This strean	n crosses	
Riparian	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	Old Grain Road through a small 12 inch culvert. The channel divides into two approximately 30 feet from the road. Field Sheet 21-STR-26		
I		High	Low	High	Low	High	Low			
		ı ııgıı	2011	riigii	2011	ı ııgıı	2011			
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5			
Scores  Delineate ripar Determine squ	1.5 rian areas along each stream bank uare footage for each by measuring	1.2	1.1	0.85	0.75	0.6 Ensure t				
Scores  1. Delineate ripar 2. Determine squipelow.	rian areas along each stream bank	1.2 into Condition Ca	1.1 tegories and Congth and width. Ca	0.85	0.75	0.6  Ensure to of % F	0.5			
Scores  1. Delineate ripar 2. Determine squ pelow. 3. Enter the % R	rian areas along each stream bank uare footage for each by measuring	1.2 into Condition Ca	1.1 tegories and Congth and width. Ca	0.85	0.75	0.6  Ensure to of % F	0.5 the sums			
Scores  Delineate ripar  Determine squelow.  B. Enter the % Ri	rian areas along each stream bank uare footage for each by measuring iparian Area and Score for each rip	1.2 into Condition Ca	1.1 tegories and Congth and width. Ca	0.85	0.75	0.6  Ensure to of % F	0.5 the sums Riparian qual 100			
Scores  1. Delineate ripar 2. Determine squ pelow. 3. Enter the % R	rian areas along each stream bank uare footage for each by measuring iparian Area and Score for each rip % Riparian Area> 100%	1.2 into Condition Ca	1.1 tegories and Congth and width. Ca	0.85	0.75	0.6  Ensure to of % F	0.5 the sums Riparian qual 100	CI= (Sum % RA * \$	Scores*0.01)/2	
Scores  1. Delineate ripar 2. Determine squ pelow. 3. Enter the % R	rian areas along each stream bank uare footage for each by measuring iparian Area and Score for each rip % Riparian Area> 100%	1.2 into Condition Ca	1.1 tegories and Congth and width. Ca	0.85	0.75	0.6  Ensure to of % F	0.5 the sums Riparian qual 100	CI= (Sum % RA * 8 <b>Rt Bank CI</b> >	Scores*0.01)/2 1.20	

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.60 RCI= (Riparian CI)/2 0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

#### INSERT PHOTOS:



Left: Typical view of strem

Right: Typical view of stream

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 7/8/2016

03-STR-B-26

Evaluator: L. Eggering, R. Mangum	County: Carolin	e	Longitude: -77	.388500
<b>Total Points:</b> 15 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 7	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1)	2	3
5. Depositional bars or benches		1	2	3
7. Recent alluvial deposits		1	2	3
B. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes :	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 3				
12. Presence of Baseflow	0	1	2	3
3. Iron oxidizing bacteria	0	(1)	2	3
4. Leaf litter	1.5	1	0.5	0
5. Sediment on plants or debris	0	0.5	1	1.5
6. Organic debris lines or piles	0	0.5	1	1.5
7. Soil-based evidence of high water table?	No	0 = 0	Yes =	= 3
C. Biology (Subtotal = 5				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	
*perennial streams may also be identified using other meth	ods. See p. 35 of manua	l.		
Notes: Standing water near culvert/road. 21-STF	R-26			
Sketch:	/ 1//		(0)	. 7
standing viater		/ ro we		1/
0 0				

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR **Impact** Project # **Project Name** Locality HUC Date SAR# Class length Factor 02080104 7/19/16 N/A DC2RVA - Area 03b VΑ R6 1 Name(s) of Evaluator(s) Stream Name and Information L. Eggering, R. Mangum 03-STR-B-27 (Tributary to Snow Creek) 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Recent rain added to Optimal Suboptimal Marginal Poor Low Marginal: flow. 21-A-STR-50 High Poor: Non-maintained, lense herbaceou ow Suboptimal High Suboptima Riparian areas Lawns, mowed Riparian areas High Marginal: Low Poor: and maintained vegetation, riparian areas with tree stratum with tree stratum areas, nurseries Impervious (dbh > 3 inches) ense herbaceou no-till cropland; surfaces, mine present, with vegetation with acking shrub and actively grazed pasture, sparsely Free stratum (dbh > 3 inches) presen resent, with 30% spoil lands. 30% tree canor Riparian either a shrub tree stratum, hay with > 60% tree canopy cover to 60% tree enuded surface roduction, ponds cover and a layer or a tree Buffers intained understory. Wetlands anopy cover and vegetated nonrow crops, active maintained laver (dbh > 3 open water. If maintained area, recently seeded containing both eed lots, trails, o understory. inches) present, with <30% tree present, tree herbaceous and other comparable Recent cutover stratum (dbh >3 shrub lavers or a and stabilized, or conditions. (dense vegetation). inches) present canopy cover other comparable with <30% tree understory. condition. canopy cover with maintained understory High Low High Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below. Blocks equal 100 100% 100% % Riparian Area> Right Bank Score : 1.5 100% 100% Rt Bank CI > 1.50 CI % Riparian Area> Left Bank 1.50 1.50 Lt Bank CI > REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number THE REACH CONDITION INDEX (RCI) >> 0.75 RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

INSERT PHOTOS:



Left: Typical view of stream and adjacent vegetation

Right: Typical view of stream and adjacent vegetation

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 7/19/2016

03-STR-B-27

Evaluator: L. Eggering, R. Porath	County: Carolin	ne	Longitude: -77	.399620
Total Points: 16.5	Stream Determ	ination (circle one)	Other	
Stream is at least intermittent		ermittent Perennial	e.g. Quad Name:	
if ≥ 19 or perennial if ≥ 30*	Ерпотого		o.g. Quad rvamo.	
A. Geomorphology (Subtotal = 8)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	1	2)	3
3. In-channel structure: ex. riffle-pool, step-pool,				
ripple-pool sequence		1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	N	0 = 0	Yes =	
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $3$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5		1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes =	= 3
C. Biology (Subtotal = $5.5$				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	
*perennial streams may also be identified using other method	ods. See p. 35 of manua			
Notes: Tributary to Snow Creek, recent rainfall a	· · · · · · · · · · · · · · · · · · ·			
-				
Sketch: +1w 4)	Draw	2:Lal	- / set	·K/
civide d'ide	50		Shew eree	

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Cowardin Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 03b ۷A 02080104 07/8/2016 R6 Name(s) of Evaluator(s) Stream Name and Information 03-STR-B-28 L. Eggering, R. Mangum 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor This stream parallels Low Marginal: Non-maintained, Rt. 2 after an outfall High Poor: ow Suboptima ligh Suboptima awns, mowed near a culvert. There High Marginal: Riparian areas nse herbaced Low Poor: and maintained vegetation, riparian area with tree stratur Impervious surfaces, mine spoil lands, is sand and debris with tree stratur areas, nurseries (dbh > 3 inches riparian areas acking shrub and (dbh > 3 inches) no-till cropland within the stream. vegetation with present, with Free stratum (dbh > 3 inches) preser resent, with 30% to 60% tree actively grazed Riparian 30% tree canon either a shrub tree stratum, hay pasture, sparsely vegetated non-maintained area, with > 60% tree canopy cover and ar non-maintained understory. Wetland There is a maintained enuded surfaces cover and a maintained layer or a tree layer (dbh > 3 open water. If present, tree canopy cover an containing both row crops, active eed lots, trails, o **Buffers** lawn on the the left understory inches) present herbaceous and recently seeded ther comparable bank; the maintained Recent cutove with <30% tree stratum (dbh >3 shrub layers or a non-maintained and stabilized, o conditions. inches) present with <30% tree (dense vegetation) canopy cover. lawn turns into a understory wooded area further anopy cover wit maintained away from the bank. understory. 21-STR-27 High Low High Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

3. Enter the % Riparian Area and Score for each riparian category in the blocks below

80%

0.75

80%

% Riparian Area:

Score >

% Riparian Area>

Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the

lescriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you

20%

0.5

20%

THE REACH CONDITION INDEX (RCI) >> 0.43

RCI= (Riparian CI)/2

CI= (Sum % RA \* Scores\*0.01)/2

0.70

1.00

CI

0.85

0

COMPENSATION REQUIREMENT (CR) >>

Rt Bank CI >

Lt Bank CI >

CR = RCI X LF X IF

Ensure the sums

of % Riparian

Blocks equal 100

100%

100%

INSERT PHOTOS:

Right Bank

Left Bank



Left: Typical view of stream channel

Right: Culvert carrying stream under railroad

כ	ES	CR	IBE	PRC	POSE	ED IME	ACT:

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 7/8/2016

03-STR-B-28

Evaluator: L. Eggering, R. Mangum	County: Spotsy	/Ivania	Longitude: -77.402364		
Total Points: 15 Stream is at least intermittent		ination (circle one) ermittent Perennial	Other e.g. Quad Name:		
if ≥ 19 or perennial if ≥ 30*	Ephemeral	similitent i ereminar	e.g. Quad Name.		
A. Geomorphology (Subtotal = 9 )	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	(1)	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	N	0 = 0	Yes:	= 3	
artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = 2)					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria		1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?		0 = 0	Yes:		
C. Biology (Subtotal = 4 )					
18. Fibrous roots in streambed	3	2	1	0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)		1	2	3	
21. Aquatic Mollusks		1	2	3	
22. Fish		0.5	 1	1.5	
23. Crayfish		0.5	1	1.5	
24. Amphibians		0.5	<u>.</u> 1	1.5	
25. Algae		0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0		
*perennial streams may also be identified using other met	hods. See p. 35 of manua		2 - 110 0 1101 - 0		
Notes: 21-STR-27	11040. 000 p. 00 01 11141141	ш.			
10.000. = 1 0 111 = 1					
			Sporsy /	anne	
Sketch:	Routes	2 11 -			
		CUIVE	2 V+ 1		
		12			
		/			
\\ Island					

		Stre			sment Methodology f		-	n 1)			
					nels classified as				Imm a at/CAD	lmm a at	i
Project #	Pro	ject Name	!	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RV	/A - Area (	)3b	VA	R2SB	02080104	07/19/2016				
	e(s) of Evaluator(s	•	Stream Name	e and Informa	tion	02 CT	D D 20				I
	gering & R. Por						R-B-29				;
. Channel C	condition: Assess the	e cross-section	on of the stream a		dition (erosion, agg	,					•
	Optimal	ı	Subo	ptimal	Marg	ginal	Po	oor	Se	/ere	ı
	-	ALLAND AND AND AND AND AND AND AND AND AND	V			less than Severe or stable than Severe	Overwider Vertically/laterally	ned/incised. unstable. Likely to	1	5	ı
Channel Condition	Very little incision or activ 100% stable banks. Vege protection or natural roci (80-100%). AND/OR & bars/bankfull benches a Access to their original if fully developed wide bankits	etative surface kk, prominent Stable point are present. floodplain or ikfull benches.	erosion or unproted of banks are st Vegetative proted prominent (60- Depositional feat stability. The bar channels are well did has access to ba	ew areas of active ted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow efined. Stream likely nkfull benches, or	or Poor due to lo Erosion may be pre both banks. Vegetat 60% of banks. S bevertical or unde 60% of stream is co Sediment may be t contribute instabili contribute to st	wer bank slopes. esent on 40-60% of tive protection on 40 treambanks may rcut. AND/OR 40- overed by sediment. emporary/transient, ity. Deposition that tability, may be	widen further. Ma are near vertical. E 80% of banks. Ve present on 20-40 insufficient to preve 60-80% of the str sediment. temporary/transi contributing to inst	jority of both banks rosion present on 60 (getative protection % of banks, and is ent erosion. AND/OR earn is covered by Sediment is ent in nature, and ability. AND/OR V-	vertical/lateral in incision, flow co banks. Streamb rooting depth, r vertical/undercut. \ present on less th not preventing ero	(or excavated), instability. Severe ntained within the ed below average najority of banks (egetative protection an 20% of banks, is sion. Obvious bank Erosion/raw banks	
	Mid-channel bars, and tra few. Transient sedimen covers less than 10%	nt deposition	portions of the r sediment covers 10 bott	floodplains along reach. Transient 0-40% of the stream tom.	channels have vege > 40% of the bank features which cor	AND/OR V-shaped etative protection on and depositional antribute to stability.	protection is prese banks and stable se abs	s have vegetative ent on > 40% of the ediment deposition is eent.	on 80-100%. AN channel. Greater bed is covered contributing to it thread channels a	D/OR Aggrading than 80% of stream d by deposition, astability. Multiple nd/or subterranean ow.	CI
Score	3		2	.4	2	2	1	.6		1	2.0
Riparian Buffers	Optimal  Tree stratum (dbh > 3 inc with > 60% tree canopy non-maintaned understo located within the ripa	ches) present, cover and a ory. Wetlands	High Suboptimal:	3 inches) present, with > 30% tree canopy cover and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	stream is lo within a ma		
			non-maintained understory.	vegetation).		inches) present, with <30% tree canopy cover with maintained understory.	stabilized, or other comparable	conditions.			
			non-maintained understory.	vegetation).		with <30% tree canopy cover with maintained	stabilized, or other comparable condition.	conditions.			
Condition Scores	1.5		non-maintained		High 0.85	with <30% tree canopy cover with maintained understory.	stabilized, or other comparable				
Scores  1. Delineate ripa 2. Determine squ	rian areas along each s uare footage for each by tiparian Area and Score	oy measuring of for each ripa	High 1.2  Into Condition Cate or estimating lenge	Low 1.1 egories and Cond th and width. Cal	High 0.85	with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	stabilized, or other comparable condition.  High  0.6  Ensure of % F	Low			
Scores  Delineate ripa  Determine square  Enter the % R	urian areas along each s uare footage for each by	y measuring	High 1.2  Into Condition Cate or estimating lenge	Low 1.1 egories and Cond th and width. Cal	High 0.85	with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	stabilized, or other comparable condition.  High  0.6  Ensure of % F	Low 0.5 the sums Riparian	CI= (Sum % RA * 5 * 5	cores*0.011//2	
Scores  Delineate ripa Determine sq Enter the % R Right Bank	rian areas along each s uare footage for each by tiparian Area and Score	oy measuring of for each ripa	High 1.2  Into Condition Cate or estimating lenge	Low 1.1 egories and Cond th and width. Cal	High 0.85	with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	stabilized, or other comparable condition.  High  0.6  Ensure of % F	Low 0.5 the sums Riparian	CI= (Sum % RA * S Rt Bank CI >	cores*0.01)/2 1.50	CI
Delineate ripa Determine sq Enter the % R Right Bank Left Bank	trian areas along each suare footage for each by tiparian Area and Score    Riparian Area   Score	y measuring of the for each ripart 100% 1.5 100% 1.5	High 1.2  Into Condition Cate or estimating leng	Low 1.1 egories and Cond th and width. Calc ne blocks below.	High 0.85 ition Scores using culators are provid	with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. led for you below.	stabilized, or other comparable condition.  High  0.6  Ensure of % F  Blocks 6	Low 0.5 the sums riparian 100%	Rt Bank CI >	1.50 1.50	CI 1.50
Scores  Delineate ripa Determine sq Enter the % R Right Bank Left Bank B. INSTREAM	trian areas along each suare footage for each by tiparian Area and Score  % Riparian Area>  Score >	y measuring of for each ripart 100% 1.5 100% 1.5 substrate size	High 1.2  Into Condition Cate or estimating lenguarian category in the	Low 1.1 egories and Cond th and width. Call ne blocks below.  and depths; woody	High 0.85  ition Scores using culators are provided and leafy debris;	with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. led for you below.	stabilized, or other comparable condition.  High  0.6  Ensure of % F  Blocks 6	Low 0.5 the sums riparian 100%	Rt Bank CI > Lt Bank CI > NOTES>>Poriffles; various	1.50 1.50 ols and	
Scores  Delineate ripa Determine square B. Enter the % R Right Bank  Left Bank  B. INSTREAN Danks; root mats  Instream Habitat/ Available	urian areas along each suare footage for each but tiparian Area and Score  % Riparian Area  Score >  % Riparian Area>  Score >  % Riparian Area>  Score >  M HABITAT: Varied s ; SAV; riffle poole comp  Optimal  Habitat elements are typ	to present the state of the sta	High 1.2  Into Condition Cate or estimating leng arian category in the sease, water velocity a features.  Subo Stable habitat eler present in 30-50%	Low 1.1 egories and Cond th and width. Call ne blocks below.  and depths; woody	High  0.85  ition Scores using culators are provid  and leafy debris; al Category  Mary  Stable habitat eler present in 10-30% of	with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. led for you below.  stable substrate;  ginal ments are typically	stabilized, or other comparable condition.  High  0.6  Ensure of % F  Blocks 6  low embededness	Low 0.5 the sums Riparian requal 100 100% 100% ; shade; undercut	Rt Bank CI > Lt Bank CI > NOTES>>Po	1.50 1.50 ols and	
Scores  Delineate ripa Delineate rip	vian areas along each suare footage for each by stiparian Area and Score  % Riparian Area > Score >  % Riparian Area > Score >  % Riparian Area > Score > Optimal	to present the state of the sta	High 1.2  Into Condition Cate or estimating leng arian category in the categor	Low 1.1 egories and Cond th and width. Cale ne blocks below.  Conditions ptimal ments are typically of the reach and are	High  0.85  ition Scores using culators are provid  and leafy debris; al Category  Mary  Stable habitat eler present in 10-30% of	with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. led for you below.  stable substrate;  ginal  ments are typically of the reach and are anintenance of	stabilized, or other comparable condition.  High  0.6  Ensure of % F  Blocks 6  Habitat elements lacking or are uplements are typic	Low 0.5  the sums Riparian equal 100 100% 100% ; shade; undercut	Rt Bank CI > Lt Bank CI > NOTES>>Poriffles; various	1.50 1.50 ols and	

	St	tream In	npact A	ssessm	ent For	m Page	2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02080104	07/19/2016	03-STR-B29	500	1
	ALTERATION: Stream crossin rictions, livestock	ngs, riprap, concre		ncrete blocks, strai	ightening of chanr	nel, channelization	, embankments,	NOTES>>Na in forested d	tural channel Iraw.
	Negligible	vere							
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of by any of the chan in the parameter g	of reach is disrupted nel alterations listed guidelines AND/OR lored with gabion, r cement.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	DEACH (	CONDITION	NDEY and S	TDEAM CON	UDITION LINI	TS EOD THE	S DEVCH		

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.30

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF



Top Left: Typical view of stream and surrounding vegetation

Bottom Right: Typical view of stream and surrounding vegetation

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 7/19/2016

03-STR-B-29

	+			
Evaluator: L. Eggering, R. Porath	County: Caroline	Э	Longitude: -77	.408736
Total Points: 39.5	Stream Determin	nation (circle en	Other	
Stream is at least intermittent	Ephemeral Inter			
f ≥ 19 or perennial if ≥ 30*				
A. Geomorphology (Subtotal = 18.5	Absent	Weak	Moderate	Strong
a. Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
B. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
i. Active/relict floodplain	0		2	3
5. Depositional bars or benches	0	1	2	3
. Recent alluvial deposits	0	1	2	3
3. Headcuts	0	1	2	3
. Grade control	0	0.5	1	1.5
0. Natural valley	0	0.5	1	(1.5)
Second or greater order channel	No	= 0	Yes =	= 3
artificial ditches are not rated; see discussions in manual				
3. Hydrology (Subtotal = 12 )				
2. Presence of Baseflow	0	1	2	<u> </u>
Iron oxidizing bacteria	0	1	2	3
4. Leaf litter	1.5	$\Box$	0.5	0
5. Sediment on plants or debris	0	0.5	1	1.5
6. Organic debris lines or piles	0	0.5		1.5
7. Soil-based evidence of high water table?	No	= 0	Yes =	= 3
C. Biology (Subtotal = 9.0 )	<del>_</del>			
8. Fibrous roots in streambed	3	2	1	0
Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
1. Aquatic Mollusks	0	1	2	3
	0	0.5	1	1.5
2. Fish	0			
3. Crayfish	0	0.5	1	1.5
			1	1.5 1.5
3. Crayfish	0	0.5		
23. Crayfish 24. Amphibians	0	0.5 0.5 0.5		1.5 1.5
23. Crayfish 24. Amphibians 25. Algae	0 0 0 0 thods. See p. 35 of manual	0.5 0.5 FACW = 0.75;	1	1.5 1.5

		Stre					(Forr	n 1)				
					lethodology f							
Project #		Project Name		Locality	nels classified as Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor		
N/A	DC	2RVA - Area	03b	VA	R4SB3	02080104	07/20/2016					
Name	e(s) of Evalua	tor(s)	Stream Name	and Informa	tion							
L. Pos	staski, R. Ma	angum				03-ST	R-B-30					
. Channel C	Condition: Asse	ss the cross-secti	on of the stream a									
	Opt	imal	Subo	ptimal	Conditional Categor	y ginal	Po	or	Sev	vere		
Channel Condition	100% stable banks. protection or natur (80-100%). AND bars/bankfull ben Access to their ori fully developed wid Mid-channel bars, a few. Transient se	Very little incision or active erosion; 80- 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition few. Transient sediment deposition		ew areas of active ted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR rures contribute to nkfull and low flow efined. Stream likely nkfull benches, or floodplains along each. Transient -040% of the stream	Ib banks. Majority e (60-80%). or natural rock (%) AND/OR so contribute to all and low flow ed. Stream likely ull benches, or odplains alongh. Transient to the contribute to stability. Deposition that contribute to stability. Deposition that contribute to stability, may be temporary/transient contribute to stability, may be temporary/transient contribute to stability, may be temporary/transient.		Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60- 0-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by		D-banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading			
0			bottom.		> 40% of the bank features which cor				flo	nd/or subterranean ww.	C	
Score	;	5	2	.4	]	2	1.	ь	<u> </u>	[	2	
. KIPAKIAN	Opt	imal	Cor	nditional Cate	gory	ginal	Po		NOTES>>Wetlands are located along both banks. Portions of the			
Riparian Buffers	Tree stratum (dbh: with > 60% tree c; non-maintained un located within th	anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	nurseries; no-till	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		are incised. ated behind a mowed nming pool the wetland		
			High	Low	High Low 0.85 0.75		High Low					
Condition Scores	1.	.5	1.2	1.1			0.6	0.5				
2. Determine squ	urian areas along e uare footage for ea tiparian Area and S	ach by measuring	or estimating leng	th and width. Cal	ŭ		Ensure t of % R Blocks e	iparian				
Right Bank	% Riparian Area>	100%						100%				
g Duin	Score >	1.5							CI= (Sum % RA * S	cores*0,01)/2		
g Dank		E00/	50%					100%	Rt Bank CI >	1.50	(	
	% Riparian Area>	50%	0070						Lt Bank CI >	0.85	1.	
Left Bank	% Riparian Area>	0.6	1.1									
Left Bank 3. INSTREAN	Score >  // HABITAT: Va ; SAV; riffle poole of	0.6 ried substrate size	1.1 es, water velocity a features.	Condition	al Category				silty substrat	e. Good ent. Leafy		
Left Bank 3. INSTREAN	Score >  // HABITAT: Va ; SAV; riffle poole of	0.6 ried substrate size complexes, stable	1.1  as, water velocity of features.  Subo  Stable habitat ele present in 30-50% adequate for in a subsection of the sub		Stable habitat eler	ginal ments are typically of the reach and are naintenance of	Po	Or listed above are stable. Habitat ally present in less	silty substrat	e. Good ent. Leafy	(	

	St	tream Ir	npact A	ssessm	ent For	m Page	2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB3	02080104	07/20/2016	03-STR-B30	500	1
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock  Conditional Category									
	Negligible Mi		nor	Moderate		Severe			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	by any of the chang in the parameter of 80% of banks sh	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH (	CONDITION	NDFY and 9	TREAM COM	NDITION LINI	TS EOD THI	SPEACH		•

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.12

0

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:

Top Left: Stream channel. Swimming pool adjacent to channel.

Top Right: Typical view of stream



NC DWO Stream Identification Form Version 4.11

03-STR-B-30

Date: 07/20/2016	Project/Site: DC2RVA - Area 03	Latitude: 38.205309
Evaluator: L. Postaski; R. Mangum	County: Spotsylvania	Longitude: -77.422901
<b>Total Points:</b> 19 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

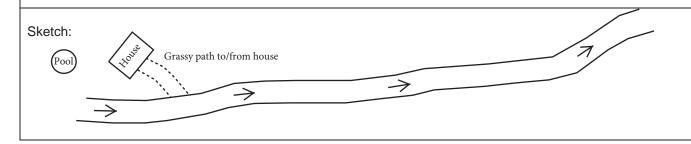
II ≥ 19 01 perennan ii ≥ 30					
A Commonwhalamu (O Livid 10.5	Abcont	Wook	Madarata	Ctrong	
A. Geomorphology (Subtotal = 10.5	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	1	2	3	
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	No	$\mathbf{r} = 0$	Yes = 3		
<sup>a</sup> artificial ditches are not rated; see discussions in manual			•		
B. Hydrology (Subtotal = 3.5)					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
40.0			4	4.5	

16. Organic debris lines or piles 1.5 No = 0 17. Soil-based evidence of high water table? Yes = 3

C. Biology (Subtotal = 5(2) 18. Fibrous roots in streambed 3 0 19. Rooted upland plants in streambed 3 (1)0 20. Macrobenthos (note diversity and abundance) 0 (1) 3 21. Aquatic Mollusks 0 2 3 22. Fish 0.5 1.5 0 0.5 23. Crayfish 0 1 1.5 24. Amphibians 0 0.51 1.5 25. Algae 0 0.5 1.5 FACW = 0.75; OBL = 1.5 Other = 0 26. Wetland plants in streambed

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: 21-B-STR-05



#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 03b ۷A 02080104 07/20/2016 R6 Name(s) of Evaluator(s) Stream Name and Information 03-STR-B-31 L. Postaski, R. Mangum 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable **Conditional Category** NOTES>> Optimal Suboptimal Marginal 21-B-STR-04 Low Marginal: Non-maintained, dense herbaceou High Poor: awns, mowed ligh Suboptima High Marginal: Riparian areas and maintained Low Poor: Riparian areas with tree stratum Non-maintained vegetation, with tree stratum (dbh > 3 inches) present, with 30% to 60% tree Impervious surfaces, mine spoil lands, areas, nurseries no-till cropland; riparian areas acking shrub and (dbh > 3 inches) Free stratum (dbh > 3 inches) preser actively grazed Riparian 30% tree canop either a shrub tree stratum, hay with > 60% tree canopy cover layer or a tree layer (dbh > 3 inches) present, with <30% tree roduction, ponds open water. If present, tree asture, sparsely nuded surface cover and a canopy cover an vegetated non-maintained area row crops, active eed lots, trails, o Buffers maintained understory. herbaceous and recently seeded ther comparable stratum (dbh >3 Recent cutove shrub layers or a non-maintained understory. and stabilized, o conditions inches) present, with <30% tree canopy cover. other comparable condition. anopy cover wit maintained High Low High High Low Condition 0.85 0.75 0.6 0.5 1.5 1.2 1.1 Scores riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% % Riparian Area> Right Bank 1.5 CI= (Sum % RA \* Scores\*0.01)/2 100% 100% Rt Bank CI > 1.50 CI % Riparian Area> Left Bank Score > 1.5 Lt Bank CI > 1.50

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

THE REACH CONDITION INDEX (RCI) >> 0.75

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



IOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

Typical view of stream

NC DWQ Stream Identification Form Version 4.11

03-STR-B-31

Date: 07/20/2016	Project/Site: DC2RVA - Area 03	Latitude: 38.204672
Evaluator: L. Postaski; R. Mangum	County: Spotsylvania	Longitude: -77.425658
<b>Total Points:</b> 18.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*	Ephlemeral	militent Fereim	e.y. Quau Mame.			
A. Geomorphology (Subtotal = 8.5	Absent	Weak	Moderate	Strong		
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3		
Sinuosity of channel along thalweg	0	$\overline{}$	2	3		
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3		
Particle size of stream substrate	0	1	2	3		
5. Active/relict floodplain	0	1	2	3		
6. Depositional bars or benches	0	1	2	3		
7. Recent alluvial deposits	0	1	2	3		
8. Headcuts	0	1	2	3		
9. Grade control	0	0.5	1	1.5		
10. Natural valley	0	0.5	1	1.5		
11. Second or greater order channel	No	=0	Yes:	Yes = 3		
<sup>a</sup> artificial ditches are not rated; see discussions in manua	al					
B. Hydrology (Subtotal = 4)						
12. Presence of Baseflow	0	1	2	3		
13. Iron oxidizing bacteria	0	1	2	3		
14. Leaf litter	1.5	1	0.5	0		
15. Sediment on plants or debris	0	0.5	1	1.5		
16. Organic debris lines or piles	0	0.5	1	1.5		
17. Soil-based evidence of high water table?	No	= 0	Yes:	= 3		

12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes	= 3
C Riology (Subtotal - 6				

C. Biology (Subtotal = 6				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other = 0	0)

\*perennial streams may also be identified using other methods. See p. 35 of manual. Notes: 21-B-STR-04

Sketch: Wetland  $\leftarrow$  $W_{etl_{and}}$ 

		Stre			sment		-	n 1)		
					lethodology f nels classified as					
Project #		Project Name		Locality	Cowardin	HUC	Date	SAR#	Impact/SAR	Impact
-		•		-	Class.	нос	Date	SAR#	length	Factor
N/A		2RVA - Area		VA	R2SB	02080104	07/19/2016			
	ne(s) of Evaluat		Stream Name	e and Informa	tion	00 OT	D D 00			
L. Po	staski, R. Ma	angum				03-51	R-B-32			
. Channel (	Condition: Asse	ss the cross-secti	ion of the stream a		dition (erosion, age					
	Opti	imal	Subo	ptimal		ginal	Po	or	Sev	/ere
	Sili		Cliability incincal forwards of positive Of		Poor. Banks more	less than Severe or stable than Severe	Vertically/laterally	led/incised. unstable. Likely to		(or excavated),
Channel Condition	protection or nature (80-100%). AND bars/bankfull ben Access to their ori fully developed wid Mid-channel bars, a	Vegetative surface al rock, prominent b/OR Stable point ches are present. iginal floodplain or le bankfull benches. and transverse bars diment deposition	of banks are s Vegetative protec prominent (60- Depositional feat stability. The ban channels are well d has access to ba newly developed portions of the s sediment covers 10	cted banks. Majority table (60-80%). Tool tool tool tool tool tool tool tool	both banks. Vegetat 60% of banks. S bevertical or unde 60% of stream is co Sediment may be t contribute instabili contribute to si forming/present. A channels have vege > 40% of the bank	esent on 40-60% of tive protection on 40	are near vertical. E 80% of banks. Ve present on 20-40 insufficient to preve 60-80% of the str sediment. temporary/transi contributing to inst shaped channels protection is prese banks and stable se	jority of both banks cosion present on 60- getative protection  % of banks, and is  nt erosion. AND/OR  aam is covered by  Sediment is  ent in nature, and  ability. AND/OR V- have vegetative  nt on > 40% of the  diment deposition is  ent.	banks. Streamby rooting depth, in vertical/undercut. V present on less the not preventing eros sloughing present. on 80-100%. AN channel. Greater the bed is covered contributing to in thread channels ai	ntained within the ad below average ad below average apority of banks (egetative protection an 20% of banks, is sion. Obvious bank Erosion/raw banks D/OR Aggrading han 80% of stream by deposition, stability. Multiple nd/or subterranean w.
Score	3	3	2	.4		2	1	.6	,	1
00016	`	,			1	STR-02				•
						Low Morginal	High Book Louis		transmission	the electrical corridor,
Riparian Buffers	Tree stratum (dbh : with > 60% tree cr non-maintained und located within th	anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands,	transmission which consis grass. A wet present in th area along th decending ba	corridor, sts of mowed land is e riparian e left
Buffers	with > 60% tree ca	anopy cover and a derstory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30%	Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	which consis grass. A wet present in th area along th	corridor, sts of mowed land is e riparian e left
•	with > 60% tree ca	anopy cover and a derstory. Wetlands e riparian areas.	Riparian areas with tree stratum (db - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (db x 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	which consis grass. A wet present in th area along th	corridor, sts of mowed land is e riparian e left
Condition Scores  Delineate rip:	with > 60% free conon-maintained und located within the located within	anopy cover and a derstory. Wetlands e riparian areas.  5 ach stream bank ach by measuring Score for each riparian areas.	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cat or estimating lenguarian category in the 60%	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Conduth and width. Cale	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure  of % F	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	which consis grass. A wet present in th area along th	corridor, sts of mowed land is e riparian e left
Condition Scores  Delineate rips Determine scores  Enter the % F	with > 60% free conon-maintained und located within the located within	anopy cover and a derstory. Wetlands e riparian areas.  5 ach stream bank ach by measuring score for each riparian areas.	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cat or estimating lenguarian category in the strategory in the s	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Conduth and width. Cale	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure  of % F	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums tiparian qual 100 100%	which consis grass. A wet present in th area along th	a corridor, sts of mowed cland is e riparian e left ank.
Condition Scores  Delineate rip. Determine scores  Enter the % I	with > 60% free conon-maintained und located within the located within	anopy cover and a derstory. Wetlands e riparian areas.  5 ach stream bank ach by measuring Score for each riparian areas.	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cat or estimating lenguarian category in the 60%	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Conduth and width. Cale	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure  of % F	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums tiparian qual 100 100%	which consis grass. A wet present in th area along th decending b	a corridor, sts of mowed cland is e riparian e left ank.
Condition Scores  Delineate rips Determine scores  Enter the % I	with > 60% free conon-maintained und located within the located within	anopy cover and a derstory. Wetlands e riparian areas.  5 ach stream bank ach by measuring Score for each riparian areas.	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cat or estimating lenguarian category in the 60%	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Conduth and width. Cale	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure  of % F	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums tiparian qual 100 100%	which consis grass. A wet present in th area along th decending be	corridor, sts of mowed cland is e riparian ee left ank.
Condition Scores  Delineate rips Condition Scores  Delineate rips Condition Scores  Delineate rips Condition Scores	with > 60% free conon-maintained und located within the located within	anopy cover and a derstory. Wetlands e riparian areas.  5.5  ach stream bank ach by measuring Score for each riparian area.  100% 1.2  ried substrate sizeriaders over an area.	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cat or estimating lenguarian category in the 60% 0.6	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Conduct and width and width. Call the blocks below.	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  ition Scores using culators are provid	Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure of % F  Blocks 6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums tiparian qual 100 100%	which consists grass. A wether present in the area along the decending between the second sec	corridor, sts of mowed cland is e riparian he left ank.
Condition Scores  Delineate ripe Determine scores  Enter the % if Right Bank  Left Bank  Left Bank  INSTREAL Banks; root materials	with > 60% free conon-maintained und located within the located within	anopy cover and a derstory. Wetlands e riparian areas.  5 ach stream bank ach by measuring Score for each riparian areas.  100% 1.2 ried substrate size complexes, stable	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cat or estimating lenguarian category in the 60%  0.6	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Conduct and width. Call the blocks below.	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  ition Scores using culators are provided to the control of the	Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.  led for you below.	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure of % F Blocks 6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums stiparian qual 100 100%  100%	which consists grass. A wether present in the area along the decending between the second sec	corridor, sts of mowed cland is e riparian he left ank.
Condition Scores  Delineate rips Condition Scores  Delineate rips Condition Scores  Delineate rips Condition Scores	with > 60% free conon-maintained und located within the located within	ach stream bank ach by measuring Score for each rip.  100% 1.2  100% 1.2  ried substrate sizicomplexes, stable imal	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cat or estimating lenguarian category in the 60% 0.6  Stable habitat elepresent in 30-50% adequate for radical strategy and the first stable habitat elepresent in 30-50% adequate for radical strategy and the first stable habitat elepresent in 30-50% adequate for radical strategy and the first stable habitat elepresent in 30-50% adequate for radical strategy and the first stable habitat elepresent in 30-50% adequate for radical strategy and the first strategy and	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Conduct and width and width. Call the blocks below.	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  ition Scores using culators are provided to the control of the	Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. led for you below.  stable substrate; ginal  ments are typically of the reach and are maintenance of	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure of % F  Blocks 6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums tiparian qual 100 100%	which consists grass. A wether present in the area along the decending between the second sec	corridor, sts of mowed cland is e riparian he left ank.
Condition Scores  Delineate rip. Determine sco. Enter the % I Right Bank  Left Bank  B. INSTREAI Ananks; root mate Habitat/ Available	with > 60% free conon-maintained und located within the located within	ach stream bank ach by measuring Score for each rip.  100% 1.2  100% 1.2  ried substrate sizicomplexes, stable imal	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cat or estimating lenguarian category in the category	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  egories and Conditional thand width. Calculate blocks below.  Conditional ments are typically of the reach and are maintenance of	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  ition Scores using culators are provided and leafy debris; al Category  Mary  Stable habitat eler present in 10-30% adequate for repopul.	Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. led for you below.  stable substrate; ginal  ments are typically of the reach and are maintenance of	mowed, and maintained areas, nurseries, no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure  of % F  Blocks 6  Habitat elements lacking or are u elements are typic than 10% of the condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums tiparian qual 100 100%  100%  is listed above are nstable. Habitat ally present in less	which consists grass. A wether present in the area along the decending between the second sec	corridor, sts of mowed cland is e riparian he left ank.

Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02080104	07/19/2016	03-STR-B32	500	1
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock									
				al Category					
	Negligible	Mil	nor		erate	Severe			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel	of the channel	by any of the chang in the parameter of	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH (	CONDITION	NDEX and S	TREAM CON	NDITION UNI	TS FOR THIS	S REACH		•

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.06

0

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF



Top Left: 21-B-STR-02, channel. Top Right: Riparian vegetation.

NC DWO Stream Identification Form Version 4.11

03-STR-B-32

1.5

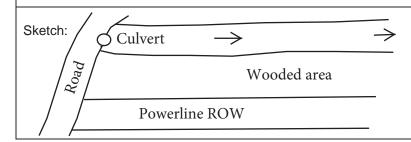
Date: 07/19/2016	Project/Site: DC2RVA - Area 03	Latitude: 38.204153
Evaluator: L. Postaski; R. Mangum	County: Spotsylvania	Longitude: -77.432301
Total Points: 44 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*		2 promotal intermitted of ordinary of gradual warner						
A. Geomorphology (Subtotal = 22.5	Absent	Weak	Moderate	Strong				
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)				
2. Sinuosity of channel along thalweg	0	1	2	3				
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3				
4. Particle size of stream substrate	0	1	2	3				
5. Active/relict floodplain	0	1	2	3				
6. Depositional bars or benches	0	1	2	3				
7. Recent alluvial deposits	0	1	2	3				
8. Headcuts	0	1	2	3				
9. Grade control	0	0.5	1	1.5				
10. Natural valley	0	0.5	1	(1.5)				
11. Second or greater order channel	No	0 = 0	Yes	= 3				
a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 12.5)								
12. Presence of Baseflow	0	1	2	3				
13. Iron oxidizing bacteria	0	1	2	3				
14. Leaf litter	1.5	1	0.5	0				
15. Sediment on plants or debris	0	0.5	1	1.5				
16. Organic debris lines or piles	0	0.5	0_	1.5				
17. Soil-based evidence of high water table?	No	0 = 0	Yes = 3					
C. Biology (Subtotal = 9								
18. Fibrous roots in streambed	3	2	1	0				
19. Rooted upland plants in streambed	3	2	1	0				
20. Macrobenthos (note diversity and abundance)	0	1	2	3				
21. Aquatic Mollusks	0	1	2	3				
22. Fish	0	0.5	1	1.5				

22. Fish (0.5)1.5 23. Crayfish 0 0.5 1.5 24. Amphibians 0 0.5 1.5

25. Algae 0 (0.5) FACW = 0.75; OBL = 1.5 Other = 0 26. Wetland plants in streambed \*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: A culvert is located near the road; rip rap is present near the culvert. 21-B-STR-02



Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date:

03-STR-B-33

Latitude:

Evaluator:	County: Spotsy	vlvania	Longitude:		
<b>Total Points:</b> 0 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial  Other e.g. Quad Name:				
	•				
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
Sinuosity of channel along thalweg	0	1	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	N	0 = 0	Yes	= 3	
a artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal =)					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	N	o = 0	Yes	= 3	
C. Biology (Subtotal =)	·				
18. Fibrous roots in streambed	3	2	1	0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	1	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other = 0	)	
*perennial streams may also be identified using other methods	. See p. 35 of manua	al.			
Notes: This resource is located outside the study co	orridor. No field	sheets.			
Sketch:					

	Ephe	mera		fied Stream N	/lethodology f	ment for use in Virg		(For	m 1a)		
Project #	# Project Name		)	For us Locality	e in ephemeral s Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	N/A DC2RVA - Area		03b	VA	R6	02080104	07/19/2016		1		
	e(s) of Evalua	. ,	Stream Name and Information			D D 24					
L. Pos	taski, R. M	angum				03-511	R-B-34				
2. RIPARIAN	N BUFFERS:	Assess both bank		•		ugh measuremen	ts of length & wid	th may be accept			
	Optimal		Conditional Cate Suboptimal		Marginal		Poor		NOTES>> No data, USM Field		
Riparian Buffers	Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.		to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	sheet missing.		
Condition Scores	1	.5	1.2	1.1	0.85	0.75	0.6	0.5			
Delineate ripa descriptors.     Determine so below.	arian areas along Juare footage for e	each by measurin	g or estimating le	ngth and width. (	Calculators are pr	•	of % F	the sums Riparian			
3. Enter the % F	Riparian Area and % Riparian Area>	Score for each ri	parian category in	n the blocks belov	w.		Blocks 6	equal 100 0%			
Right Bank	Score >							070			
	% Riparian Area>							0%	CI= (Sum % RA * S Rt Bank CI >	0.00	CI
Left Bank	Score >								Lt Bank CI >	0.00	0.00
						NDITION UN	ITS FOR TH				
NOTE: The CIs and F	RCI should be rounded	to 2 decimal places. T	he CR should be rour	nded to a whole numb	er.				CONDITION IND CI= (Riparian CI)	• •	0.00
	COMPENSATION REQUIREMENT  CR = RCI X LF X IF								0		
INSERT PHO	OTOS:										
DESCRIBE F	PROPOSED II	MPACT:									1

Project/Site: DC2RVA-Segment 21 Latitude: 38.205681

NC DWQ Stream Identification Form Version 4.11

Date: 07/19/2016

03-STR-B-34

	vania	Longitude: -77.435486		
Stream Determin	nation (circle one) rmittent Perennial	Other e.g. Quad Name:		
			Strong	
			3	
0	1	2	3	
0	1	2	3	
0	1	2	3	
0	1	2	3	
0	1	2	3	
0	1	2	3	
0	1	2	3	
0	0.5	1	1.5	
0	0.5	1	1.5	
No	= 0	Yes = 3		
-	•			
0	1	2	3	
0	1	2	3	
1.5	1	0.5	0	
0	0.5	1	1.5	
0	0.5	1	1.5	
No	= 0	Yes =	= 3	
	<u>'</u>			
3	2	1	0	
3	2	1	0	
0	1	2	3	
0	1	2	3	
0	0.5	1	1.5	
0	0.5	1	1.5	
0	0.5	1	1.5	
0		1	1.5	
		L = 1.5 Other = 0		
. See p. 35 of manual				
		ational Hydrogra	phy Databas	
	Absent	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	Absent   Weak   Moderate	

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 03b ۷A 02080104 07/19/2016 R6 Name(s) of Evaluator(s) Stream Name and Information 03-STR-B-35 L. Postaski, R. Mangum 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>>Associated with a culvert. Water is Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, ponded in the low-lying High Poor: ow Suboptima area of a gas ROW. 21-Bligh Suboptima awns, mowed High Marginal: Riparian areas nse herbaceo Low Poor: and maintained STR-01 vegetation, riparian areas acking shrub and with tree stratum Impervious surfaces, mine spoil lands, with tree stratur areas, nurseries (dbh > 3 inches) present, with (dbh > 3 inches) no-till cropland vegetation with Free stratum (dbh > 3 inches) preser resent, with 30% to 60% tree actively grazed Riparian 30% tree canon either a shrub tree stratum, hay pasture, sparsely vegetated non-maintained area, with > 60% tree canopy cover and ar non-maintained understory. Wetland enuded surfaces cover and a maintained layer or a tree layer (dbh > 3 open water. If present, tree canopy cover and containing both row crops, active eed lots, trails, or **Buffers** understory inches) present ther comparable herbaceous and recently seeded Recent cutove with <30% tree stratum (dbh >3 shrub layers or a non-maintained and stabilized, o conditions. (dense vegetation) canopy cover. inches) present with <30% tree understory anopy cover wit maintained understory. High Low High Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank Score > 0.85 Cl= (Sum % RA \* Scores\*0.01)/2 20% 80% 100% Rt Bank CI > CI % Riparian Area> 0.85 Left Bank

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

0.85

1.1

THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

Lt Bank CI >

1.05

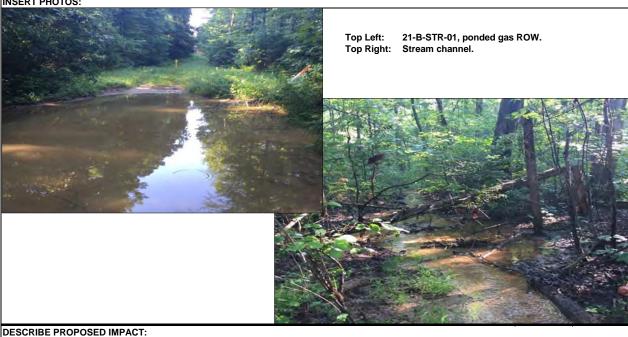
0.95

0.48

0

CR = RCI X LF X IF

### INSERT PHOTOS:



NC DWQ Stream Identification Form Version 4.11

### 03-STR-B-35

Date: 07/19/2016	Project/Site: DC2RVA - Area 03	Latitude: 38.208884
Evaluator: L. Postaski; R. Mangum	County: Spotsylvania	Longitude: -77.436227
Total Points: 18 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 9)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	0	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 4				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes	= 3
C. Biology (Subtotal = 5			_	
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method	ds. See p. 35 of manua	al.		
Notes: A culvert is located at the edge of the track	ks/access road. 2	1-B-STR-0 1		
Culver	rt O			
Sketch:				
		<b>&gt;</b>		
- DOW		Pond		
Gas ROW		[ FOIId		

		<b>O 0</b>					(Forn	<i>,</i>		
						or use in Virg				
Project #		Project Name		Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
N/A	DC	2RVA - Area	03b	VA	R4SB	02080104	07/19/2016			
Nam	e(s) of Evalua	tor(s)	Stream Name	and Informa	tion					
L. Pos	staski, R. M	angum				03-STF	R-B-36			
. Channel C	Condition: Asse	ess the cross-secti	on of the stream a							
	Opt	imal	Subo	ptimal	Conditional Catego Mar	ry ginal	Po	oor	Sev	vere
	V/		1-AE 11-A		- 1.	3	N/		1/4	1
	-		Slightly incised, few areas of active F			less than Severe or stable than Severe or		ned/incised. unstable. Likely to	Deeply incised	d (or excavated),
Channel Condition	100% stable banks. protection or natur (80-100%). ANI bars/bankfull ber Access to their or fully developed wice	or active erosion; 80 Vegetative surface ral rock, prominent D/OR Stable point riches are present. riginal floodplain or de bankfull benches.	of banks are st Vegetative protect prominent (60- Depositional feat: stability. The ban channels are well de has access to bar	tion or natural rock 80%) AND/OR ures contribute to akfull and low flow efined. Stream likely nkfull benches, or	may be present of banks. Vegetative p of banks. Streamba undercut. AND/OR covered by sedime temporary/transient, Deposition that co	ank slopes. Erosion on 40-60% of both protection on 40-60% nks may bevertical or 40-60% of stream is nt. Sediment may be contribute instability.	are near vertical. En 80% of banks. Ve present on 20-40° insufficient to preve 60-80% of the stru- sediment. St temporary/transic	% of banks, and is ent erosion. AND/OR eam is covered by Sediment is ent in nature, and	vertical/lateral ir incision, flow co banks. Streamb rooting depth, r vertical/undercut. \ present on less the not preventing ero sloughing present.	nstability. Severe intained within the bed below average majority of banks Vegetative protection ian 20% of banks, is sion. Obvious bank . Erosion/raw banks
Saara	few. Transient se covers less than	and transverse bars diment deposition in 10% of bottom.	portions of the resediment covers 10 bott	each. Transient 0-40% of the stream from.	shaped channel protection on > 40 depositional feature stal	resent. AND/OR V- s have vegetative 1% of the banks and se which contribute to oility.	shaped channels protection is prese banks and stable se abs	ability. AND/OR V- s have vegetative ent on > 40% of the adiment deposition is sent.	channel. Greater bed is covered contributing to in thread channels a flo	ND/OR Aggrading than 80% of stream d by deposition, nstability. Multiple and/or subterranean ow.
Score	,	3		.4			1	.6		1
Riparian Buffers	with > 60% tree c	> 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.		High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with ~30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	on a terrace left decendi	•
			High	Low	High	Low	High	Low		
Condition	1	.5	1.2	1.1	0.85	0.75	0.6	0.5		
					<u>l</u>					
Scores  Delineate ripa Determine sq	arian areas along e quare footage for ea Riparian Area and \$ % Riparian Area>	ach by measuring Score for each rips 100%	or estimating lengt	th and width. Cald	•	·	of % F	Riparian equal 100		
Scores  Delineate ripa Determine sq Better the % F	uare footage for ea	ach by measuring	or estimating lengt	th and width. Cald	•	·	of % F	Riparian equal 100	Cl= (Sum % RA * S	Scores*0.01)/2
Scores  Delineate ripa Determine sq Enter the % R Right Bank	uare footage for ea	ach by measuring Score for each rips 100%	or estimating lengt	th and width. Cald	•	·	of % F	Riparian equal 100	CI= (Sum % RA * S Rt Bank CI >	Scores*0.01)/2
Scores  Delineate ripa Determine sq Enter the % F	ware footage for ea Riparian Area and S % Riparian Area> Score >	ach by measuring Score for each rips 100% 1.1	or estimating lengt	th and width. Cald	•	·	of % F	Riparian equal 100 100%	,	
Scores  Delineate ripa Determine sq Enter the % F Right Bank Left Bank B. INSTREAM	% Riparian Area > Score > % Riparian Area> Score > % Riparian Area> M HABITAT: Va	Score for each rip: 100% 1.1 80% 1.2 arried substrate siz-	or estimating length arian category in the 20% 0.6 es, water velocity arian category in the 20% category i	th and width. Calc	culators are provid	·	of % F Blocks e	100%	Rt Bank CI >	1.10
Scores  Delineate ripa Determine sq BENETHE & F Right Bank Left Bank BINSTREAN	% Riparian Area > Score > % Riparian Area> Score > % Riparian Area> Score > % Riparian Area> Score > % Riparian Area> Score > % Riparian Area> Score > % Riparian Area> Score > % Riparian Area	Score for each rip: 100% 1.1 80% 1.2 arried substrate siz-	or estimating length arian category in the 20% 0.6 es, water velocity arian category in the 20% category i	th and width. Calc	culators are provid	ed for you below.	of % F Blocks e	100%	Rt Bank CI >	1.10
Scores  Delineate ripa Determine sq BENETHE & F Right Bank Left Bank BINSTREAN	% Riparian Area and % Riparian Area Score >  %	Score for each rip: 100% 1.1 80% 1.2 arried substrate siz-	20% 0.6 es, water velocity a features. Subop	and depths; woody  Condition  ptimal  ments are typically of the reach and are maintenance of	v and leafy debris;  al Category  Stable habitat ele present in 10-30% adequate for in 10-3	stable substrate; loginal ments are typically of the reach and are maintenance of	of % F  Blocks e  Blocks e  we embededness;  Pc  Habitat elements lacking or are u elements are typic	requal 100  100%  100%  100%  shade; undercut  oor  s listed above are nstable. Habitat ally present in less	Rt Bank CI >	1.10
Scores  Delineate ripa Delineate rip	% Riparian Area and % Riparian Area Score >  %	Score for each rip: 100% 1.1 80% 1.2 arried substrate siz: complexes, stable	20% 0.6 es, water velocity a features. Subop	th and width. Calc ne blocks below.  and depths; woody  Condition ptimal  ments are typically of the reach and are	v and leafy debris;  al Category  Stable habitat ele present in 10-30% adequate for in 10-3	stable substrate; lo	of % F  Blocks e  Blocks e  we embededness;  Pc  Habitat elements lacking or are u elements are typic	equal 100  100%  100%  100%  shade; undercut	Rt Bank CI >	1.10

	S	tream Ir	npact A	ssessn	nent For	m Page	2		
Project #	Applicant	Applicant		Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB	02080104	07/19/2016	03-STR-B36	500	1
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock  NOTES>>A culvert is located underneath the									
	Conditional Category    Negligible   Minor   Moderate   Severe								
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	disrupted by any of	Greater than 80% by any of the chan in the parameter g 80% of banks sh riprap, o	of reach is disrupted nel alterations listed yuidelines AND/OR lored with gabion, r cement.	railway.	
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH	CONDITION	INDEX and S	STREAM CO	NDITION UNI	TS FOR THIS	REACH		
					*				

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.20

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



Typical view of stream channel

Project/Site: DC2RVA - Area 03

NC DWQ Stream Identification Form Version 4.11

Date: 07/19/2016

03-STR-B-36

Latitude: 38.200677

Evaluator: L. Postaski; R. Mangum	County: Spotsyl	vania	Longitude: -77	.436468
Total Points: 27.5 Stream is at least intermittent		nation (circle one)	Other	
if $\geq 19$ or perennial if $\geq 30^*$	Ephemeral Inte	rmittent Perennial	e.g. Quad Name:	
•				
A. Geomorphology (Subtotal = 13.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1)	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0		2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No	) = 0	Yes:	
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 5)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1)	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes :	= 3
C. Biology (Subtotal = 9				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	·	FACW = 0.75; OB	L = 1.5 Other = 0	
*perennial streams may also be identified using other meth	nods. See p. 35 of manua	l.		
Notes: Original Field Sheet: 21-B-STR-03.				
	R	ailroad tracks		
Sketch: ————————————————————————————————————	vertO	Cas POW		
	<del>-</del>	Gas ROW		
	\ \			
	7			
·	$\overline{}$			

				fied Stream N						
Project #		Project Name		wadeable chan	nels classified a Cowardin	s intermittent or HUC	perennial Date	SAR#	Impact/SAR	Impact
Project #				Locality	Class.			JAR#	length	Factor
N/A Nam	DC2l e(s) of Evalua	RVA - Segme		VA e and Informa	R2	02080105	11/30/2015			
	stroth, M. Roc	. ,	Stream NdM	e anu miorina	atiOH	04-S	TR-01			
	Condition: Asse		tion of the stream	n and prevailing o	ondition (erosion.					
	Opti				onditional Catego		Po	or	Sev	ere
	N N		A		Ш	J	1		///	- //
	The state of the s	- HAP	1			less than Severe or	Overwiden		1	5
Channel Condition	100% stable bal surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully	n or natural rock, 00%). AND/OR bankfull benches ess to their original developed wide	erosion or unproter of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches,	or Poor due to lo Erosion may be pro both banks. Vegel 40-60% of banks. bevertical or unde 60% of strean sediment. Sec	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may crut. AND/OR 40- to covered by diment may be sient, contribute	Vertically/laterally t widen further. Majd are near vertical. E 60-80% of banh protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp	ority of both banks rosion present on as. Vegetative at on 20-40% of fficient to prevent a 60-80% of the d by sediment.	Deeply incised vertical/lateral in: incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sld	stability. Severe stained within the ed below average apority of banks ut. Vegetative on less than 20% o eventing erosion.
	bankfull benches. and transverse ba sediment depositio 10% of	ars few. Transient on covers less than bottom.	or newly develope portions of the r sediment cover stream	d floodplains along reach. Transient rs 10-40% of the bottom.	instability. Depositi stability, may be AND/OR V-shap vegetative protecti banks and depositi contribute	on that contribute to forming/present. ed channels have on on > 40% of the onal features which to stability.	nature, and contrib AND/OR V-shape vegetative protection 40% of the barn sediment depos	uting to instability. d channels have on is present on > ks and stable ition is absent.	Erosion/raw ban AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	ks on 80-100%. g channel. Greate bed is covered by uting to instability. channels and/or ean flow.
Score	3	3	2	.4	]	2	1.	6	1	<u> </u>
			В	ordered by	wetlands.	Field Shee	t 10-STR-0	1.		
				ordered by		Field Shee	t 10-STR-01	1.	NOTES>>	
	Opti	imal	Con		gory	ginal	t 10-STR-0 <sup>-</sup>		NOTES>> wetlands lo	ocated on
Riparian Buffers	Tree stratum (dbh :	> 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate	gory			Low Poor:		with tree ver. Starts
Riparian Buffers	Tree stratum (dbh : with > 60% tree canon-maintained und	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, orther cornparable conditions.	wetlands lo either side canopy co	with tree ver. Starts
Riparian Buffers  Condition Scores  Delineate rip secriptors. Determine so	Tree stratum (dbh swith > 60% tree or non-maintained un located within the located within	- 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  - 5 - 6 - 7 - 8 - 8 - 8 - 9 - 9 - 9 - 9 - 9 - 9 - 9 - 9 - 9 - 9	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 95%	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition  ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	wetlands lo either side canopy co	with tree ver. Starts	
Riparian Buffers  Condition Scores  Delineate rip Secriptors. Determine scolow. Enter the %	Tree stratum (dbh : with > 60% tree canon-maintained und located within the located withi	- 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition  ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	wetlands lo either side canopy co	with tree ver. Starts ad culvert.	
Riparian Buffers  Condition Scores  Delineate rip Secriptors. Determine scolow. Enter the %	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th  1. arian areas along the county of th	5 3 inches) present, anopy cover and a derstory. Wetlands derstory. Wetlands de riparian areas.  5 each stream ban each by measurin Score for each r 5% 0.75	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 95% 1.5	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition  ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	wetlands to either side canopy con from railroad confidence of the canopy confidence of the cano	with tree ver. Starts ad culvert.	
Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine sclow. Enter the %  Right Bank	Tree stratum (dbh : with > 60% tree cc non-maintained un located within th  1. arian areas along a quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	s 3 inches) present, anopy cover and a derstory. Wetlands to eriparian areas.  5.5  each stream ban each by measurin Score for each r 5% 0.75	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 95% 1.5	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the second of the second	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies the seeded and stabilized and sta	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	wetlands to either side canopy con from railroad from rail	with tree ver. Starts ad culvert.
Riparian Buffers  Condition Scores  Delineate rip Scriptors. Determine solow. Enter the % Right Bank  Left Bank	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th  1. arian areas along the county of th	5  sainches) present, anopy cover and a derstory. Wetlands derstory. Wetlands de riparian areas.  5  seach stream ban each by measurin Score for each r 5% 0.75  5% 0.75  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 95% 1.5  95% 1.5  Zes, water velocii	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Con the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the second of the second	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies the seeded and stabilized and sta	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	wetlands to either side canopy con from railroad confidence of the canopy confidence of the cano	with tree ver. Starts ad culvert.
Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine scolow. Enter the % Right Bank  Left Bank	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	53 inches) present, anopy cover and a dierstory. Wetlands er riparian areas.  55  each stream ban each by measuring Score for each rown of the stream ban on	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 95% 1.5  95% 1.5  zes, water velocit exes, stable featu	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (congth and width. (congth and width. (congth and width))  In the blocks below the present congth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <				

	St	ream In	npact A	ssessm	ent For	m Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2	02080105	11/30/2015	04-STR-01			
4. CHANNEL	ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of ch	nannel, channeliz	ation,	NOTES>>		
embankments, s	poil piles, constrictions, livestock		Conditiona					Culvert		
	Negligible	Mi	nor		erate	Sev	ere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with gal cem	of the channel in the parameter PR 80% of banks bion, riprap, or			CI
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5			1.30
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			
NOTE: The CIs and R	CI should be rounded to 2 decimal places. T	he CR should be roun	ded to a whole numb	er.				CONDITION IN		
								I= (Sum of all C		0
								ION REQUIRE	MENT (CR) >>	0
INSERT PHO	TOS.						OK = KO	IXLI XII		1
DESCRIBE P	PROPOSED IMPACT:									

Project/Site: DC2RVA - Area 04

NC DWQ Stream Identification Form Version 4.11

Date: 11/30/2016

04-STR-01

Latitude: 38.148492

Date: 11/30/2016	Project/Site: DC	ZRVA - Area 04	Latitude: 38.12	18492
Evaluator: K. Astroth, M. Rockwell	County: Spotsy	Ivania	Longitude: -77	.443806
Total Points: 36	Stream Determi	nation (circle one)	Other	
Stream is at least intermittent		rmitten Perennia		
if ≥ 19 or perennial if ≥ 30*			o.g. quad rumoi	
A. Geomorphology (Subtotal = 16)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	7	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes =	= 3
a artificial ditches are not rated; see discussions in manual	<u>.</u>			
B. Hydrology (Subtotal = 10)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes =	= 3
C. Biology (Subtotal = 10				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	Y	(2)	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5		1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75; O	BL = 1.5 Other = 0	
*perennial streams may also be identified using other meth	nods. See p. 35 of manua	ıl.		
Notes: No base flow.				
Field Sheet 10-STR-01.				
Sketch: Sketch: We	stream Wetland	, Je Eculv	TARI	eaver dam)
	Stream			
7	Wetland	ì	1 ,	

		Stre			ment lethodology f		) (For	m 1)		
					nels classified a					
Project #	F	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2F	RVA - Segme	nt 11	VA	R2	02080105	12/3/2015			
Nam	e(s) of Evaluat	or(s)	Stream Nam	e and Informa	ation					
D. Mitc	hell, M. Ro	ckwell				04-S	ΓR-02			
I. Channel C	Condition: Asse	ss the cross-sec	tion of the stream							
	Opti	mal	Subo	ptimal	onditional Categor	ginal	Po	or	Sev	ere
	Slightly incised, few areas of active			less than Severe or	Overwidend		1	5		
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-11 Stable point bars/t are present. Acces floodplain or fully bankfull benches. I and transverse ba sediment deposition	nks. Vegetative n or natural rock, 100%). AND/OR bankfull benches so to their original developed wide Mid-channel bars, rs few. Transient	erosion or unproted of banks are si Vegetative protect prominent (60-Depositional feat stability. The bar channels are wellikely has access to or newly develope portions of the r	ted banks. Majority able (60-80%). ion or natural rock 80%) AND/OR ures contribute to kfull and low flow I defined. Stream bankfull benches, d floodplains along	or Poor due to lo Erosion may be pre both banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sec temporary/trans instability. Depositio stability, may be	stable than Severe wer bank slopes. sesent on 40-60% of tative protection on Streambanks may rout. AND/OR 40-n is covered by diment may be sisent, contribute on that contribute to forming/present. de channels have	widen further. Maj	ority of both banks crosion present on ks. Vegetative to n 20-40% of fficient to prevent R 60-80% of the dd by sediment. orary/transient in buting to instability. dd channels have	incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sle Erosion/raw ban AND/OR Aggradin,	stability. Severe tained within the ad below average najority of banks ut. Vegetative on less than 20% of eventing erosion. Sughing present. ks on 80-100%. g channel. Greater
	10% of b	oottom.		bottom.	vegetative protecti banks and depositi	on on > 40% of the onal features which to stability.	40% of the bar sediment depos		than 80% of stream deposition, contrib Multiple thread of subterran	uting to instability. channels and/or
Score	3		2	.4	:	2	1.	6	1	
NOTES>> 2. RIPARIAN	N BUFFERS: A	ssess both bank	s's 100 foot riparia		e entire SAR. (rou			h may be accep	rtable)	
				ditional Cate			_		NOTES>>	
Riparian Buffers	Optil  Tree stratum (dbh > with > 60% tree canon-maintained und located within the	3 inches) present, nopy cover and a lerstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious syncial ands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		
			High	Low	High	Low	High	Low		
Condition	4	_			0.05	0.75	0.0	0.5		
Scores  1. Delineate ripadescriptors. 2. Determine sobelow.	arian areas along e quare footage for ea Riparian Area and 9 % Riparian Area> Score >	each stream ban	g or estimating le	ngth and width. (	Calculators are pro		0.6  Ensure the of % R  Blocks en	iparian		
Scores  Delineate ripa descriptors. Determine so delow. B. Enter the % F	arian areas along e quare footage for ea Riparian Area and % Riparian Area>	each stream ban ach by measurin Score for each ri 100% 1.5	k into Condition C	ategories and Co	I Indition Scores us Calculators are pro	sing the	Ensure the	ne sums iparian qual 100 100%	CI= (Sum % RA * S	cores*0.01)/2
Scores  1. Delineate ripa descriptors. 2. Determine so pelow. 3. Enter the % F	arian areas along e quare footage for e Riparian Area and 1 % Riparian Area> Score >	each stream ban ach by measurin Score for each ri 100% 1.5	k into Condition C	ategories and Co	I Indition Scores us Calculators are pro	sing the	Ensure the	ne sums iparian qual 100	Rt Bank CI >	1.50
Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank  3. INSTREAL	arian areas along e quare footage for ea Riparian Area and 1 % Riparian Area> Score >	each stream ban ach by measurin Score for each ri 100% 1.5 100% 1.5 ried substrate si	k into Condition C g or estimating le parian category in	ategories and Congth and width. Con the blocks below	ondition Scores us Calculators are prov.  v.  ody and leafy deb	ovided for you	Ensure the of % R Blocks en	ne sums iparian qual 100 100%	,	
Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	arian areas along equare footage for experience and a second with the second sec	each stream ban ach by measurin 100% 1.5 100% 1.5 ried substrate si	k into Condition C g or estimating le parian category ir  zes, water velocit exes, stable feature	ategories and Congth and width. Con the blocks below	ody and leafy deb	ovided for you	Ensure the of % R Blocks en	iparian qual 100 100% 100%	Rt Bank CI >	1.50
Scores  1. Delineate ripidescriptors. 2. Determine scibelow. 3. Enter the % f Right Bank  Left Bank  3. INSTREAL undercut banks; Instream Habitat/	warian areas along e quare footage for ea  Riparian Area and 9  % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Va root mats; SAV; riii	each stream ban ach by measurin Score for each ri 100% 1.5 100% 1.5 ried substrate si ffle poole comple	k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo  Stable habitat eler	ategories and Congth and width. On the blocks below y and depths; wo es.  Conditiona brimal ments are typically ments are typically	ondition Scores us Calculators are prov.  ody and leafy debuil Category Mary Stable habitat elei	ovided for you  ovided for you  ovis; stable substr	Ensure the of % R Blocks en Blocks e	ne sums iparian qual 100 100% 100%  100%  or listed above are	Rt Bank CI >	1.50
Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	arian areas along equare footage for experience and a second with the second sec	seach stream ban ach by measurin 100% 1.5 100% 1.5 ried substrate si ffle poole comple	g or estimating le parian category in  zes, water velocit exes, stable featur  Subo Stable habitat ele present in 30-50%	y and depths; wo	ody and leafy det  Category  Stable habitat ele present in 10-30 are adequate for	ovided for you  oris; stable substr	Ensure the of % R Blocks en	ne sums iparian qual 100 100%  100%  ress; shade;  or listed above are stable. Habitat	Rt Bank CI >	1.50

	C+	room In	nnaat A	ccoccw	ont For	m Dag	2			
		leani in			ent For					
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2	02080105	12/3/2015	04-STR-02			
<ol><li>CHANNEL embankments, s</li></ol>	ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, conc			straightening of ch	nannel, channeliz	ation,	NOTES>> Culvert as	enciated	
	Negligible	Mir	Conditiona nor		erate	Sev	rere	with railro		
	Negligible	1411		40 - 60% of reach	60 - 80% of reach	00.	CIC			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with ga	y of the channel in the parameter OR 80% of banks bion, riprap, or			CI
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			1.30
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			
NOTE: The CIs and R	CI should be rounded to 2 decimal places. T	he CR should be roun	nded to a whole numb	er.				CONDITION IN	, ,	
					ĺ			I= (Sum of all C		0
								I X LF X IF	(311) ->	
	Bottom Right: View down from railroad									

NC DWQ Stream Identification Form Version 4.11

04-STR-02

Spotsylvania Longitude: -77.4	33667
D	

A. Geomorphology (Subtotal = 14)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool,	0		2	3
ripple-pool sequence	U			
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0		2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	<u> </u>	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 9				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 16 )				
18. Fibrous roots in streambed	3	<b>(</b> 2 <b>)</b>	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	<b>(3)</b>
21. Aquatic Mollusks	0	1	2	(3)
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	(1.5)
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method	ds. See p. 35 of manua	ıl.		
Notes: Field Sheet 11-STR-01.				
Sketch:	/ / We	etland		
rail logs/	1 1			
	e/ /			
foad	< /			
4	/			
culvert				
culvert				

		<b>O</b> 0.0	am A	fied Stream N	lethodology f	or use in Virg	jinia				
			For use in	wadeable chan	nels classified a	s intermittent or	perennial		1040		
Project #	I	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		RVA - Segme		VA	R4SB	02080105	12/3/2015				
	e(s) of Evalua chell, M. Ro	. ,	Stream Nam	e and Informa	ation	04-5	TR-03				
	Condition: Asse		tion of the stream	and prevailing co	ondition (erosion.		1111 00				
	Opti				Conditional Catego		Po	or	Sev	ere	
		W.	1		Often incised, but	less than Severe or	Overwiden	ed/incised.	1	5	
Channel Condition	surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or full) bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient on covers less than	erosion or unproted of banks are sit Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope portions of the rasediment cover	ew areas of active cted banks. Majority table (60-80%). tion or natural rock. 80%) AND/OR urres contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along each. Transient is 10-40% of the bottom.	or Poor due to Ic Erosion may be pri both banks. Vegel 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi stability, may be AND/OR V-shap	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may rerut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present. ed channels have on on > 40% of the	widen further. Maj	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent 6 60-80% of the dby sediment. orary/transient in uting to instability, db channels have on is present on >	vertical/ateral in incision, flow cor banks. Streamler rooting depth, rr vertical/underc protection present of banks, is not pre Obvious bank sla Erosion/raw ban AND/OR Aggradin, than 80% of stream	stability. Severe tatained within the ad below average tajority of banks rut. Vegetative on less than 20% of eventing erosion. bughing present. iks on 80-100%. g channel. Greater h bed is covered by	
			Stream	bottom.	banks and depositi	ional features which to stability.	sediment depos		deposition, contrib Multiple thread of subterran	channels and/or	
Score	3	3	2	.4	1	2	1.	6	1	I	2
NOTES>>			Steeply in	cised bank	s in some	areas. Field	d Sheet 11-	B-STR-02.			
	N BUFFERS: A		c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep			
	Opti	imal  > 3 inches) present, aderstory. Wetlands	C's 100 foot riparia  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ripanian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	otable)		
2. RIPARIAI Riparian Buffers Condition	Opti Tree stratum (dbh : with > 60% tree cc non-maintained und located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.	C's 100 foot ripariat  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	an areas along the ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	otable)		
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scopelow.	Opti Tree stratum (dbh : with > 60% tree cc non-maintained und located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands er iparian areas.  5 each stream ban areach by measuring	Con Subor High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, radiative stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	otable)		
Riparian Buffers  Condition Scores  Delineate rip descriptors. Deltermine scoelow. Enter the % l	Tree stratum (dbh : with > 60% tree cc non-maintained una located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin Score for each r 100% 1.5	Con Subor High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, radiative stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5   NOTES>>	cores*0.01)/2		
Riparian Buffers  Condition Scores  Delineate rip descriptors. Deltermine scoelow. Enter the % l	Tree stratum (dbh a with > 60% tree co non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands er iparian areas.  5  each stream ban each by measurin Score for each r 100% 1.5	Con Subor High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, radiative stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	NOTES>>  NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	1.50	(1
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % Right Bank Left Bank 3. INSTREAL undercut banks;	Tree stratum (dbh : with > 60% tree ca non-maintained un located within th located within th located within th strain areas along quare footage for e Riparian Area and % Riparian Area > Score > W HABITAT: Varoot mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands er iparian areas.  5  each stream ban each by measurin Score for each r 100% 1.5  100% 1.5  aried substrate si	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable feature	to a reas along the ditional Categories and Council Categories and Categories an	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided to the condition of the condition	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>>		1.
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the %  Right Bank  Left Bank  Jundercut banks.	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5.5  each stream ban each by measuring the stream ban 100%  1.5  100%  1.5  arried substrate si fifte poole completimal  re typically present	C's 100 foot riparia  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo  Stable habitat ele present in 30-50% are adequate fo	conditional Cates ditional Cates ptimal Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Coungth and width. Coungth and width. Coungth and width. Coungth and depths; wores. Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (bdh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	1.50	

	St	ream In	npact A	ssessm	nent For	m Page	2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R4SB	02080105	12/3/2015	04-STR-03			
<ol> <li>CHANNEI embankments, s</li> </ol>	L ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, cond	crete, gabions, or	concrete blocks,	straightening of ch	nannel, channeliz	ation,	NOTES>>		
	Negligible	l Mi	Conditiona nor	al Category	erate	Sev	oro			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any o the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidellines AND/C shored with gal cem	0% of reach is of the channel in the parameter R 80% of banks bion, riprap, or ent.			CI
SCORE	1.5	1.3	1.1	0.9	0.7	0.				1.30
NOTE: The Cls and R	REACH C				NDITION UN			CONDITION IN	DEX (RCI) >>	
							RC	I= (Sum of all C	Cl's)/5	
								ON REQUIRE	MENT (CR) >>	0
INSERT PHO	OTOS:						CR = RC	IALFAIF		ı
						Top Left: Vie	w upstream	toward culve	rt under rail	
	Bottom Right: View down	stream from	rail							
DESCRIBE F	PROPOSED IMPACT:									

Project/Site: DC2RVA - Area 04

NC DWQ Stream Identification Form Version 4.11

Date: 12/3/2015

04-STR-03

Latitude: 38.136392

County: Spotsylv	vania		
	varna	Longitude: -77	.430494
	nation (circle one) mittent Perennial	Other e.g. Quad Name:	
Absent	Weak	Moderate	Strong
0	1	(2)	3
0	1	(2)	3
0	1	2	3
0	1	(2)	3
0	1	2	3
9	1	(2)	3
	1	2	3
0	1	2	3
0	0.5	1	1.5
0	0.5	1	1.5
No	= 0	Yes =	= 3
	(1)	2	3
0	1	2	3
1.5	1	0.5	0
0	0.5	1	1.5
0	0.5		1.5
No	= 0	Yes =	= 3
3	<b>(</b> 2 <b>)</b>	1	0
(3)	2	1	0
	1	2	3
$\sim$	1	2	3
	0.5	1	1.5
0	0.5 0.5	1	1.5 1.5
Q			
	0.5	1	1.5
0	0.5 0.5 0.5	1 1	1.5 1.5 1.5
0	0.5 0.5 0.5 ACW = 0.75 OB	1 1 1	1.5 1.5 1.5
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	0 1 2 0 0 1 2 0 0 1 2 0 0 1 2 0 0 1 2 0 0 1 2 0 0 1 0

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Impact Cowardin Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Segment 11 02080105 12/3/2015 Stream Name and Information Name(s) of Evaluator(s) D. Mitchell, M. Rockwell 04-STR-04 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Ephemeral stream Suboptimal Marginal Low Marginal: Non-maintained, High Poor: Lawns, mowed with nearby ligh Suboptima High Marginal: Riparian areas ense herbaceou wetlands. Flows into Riparian areas and maintained Low Poor: vegetation, riparian areas with tree stratur Non-maintained with tree stratum (dbh > 3 inches) reas, nurseries Wetland 2. 11-B-(dbh > 3 inches) ense herhaceou no-till cropland vegetation with either a shrub present, with acking shrub and Free stratum (dbh > 3 inches) preser spoil lands, STR-03 resent, with 30% to 60% tree actively grazed Riparian 30% tree canon tree stratum, hav pasture, sparsely vegetated non-maintained area, with > 60% tree canopy cover and ar enuded surface cover and a maintained roduction, ponds open water. If laver or a tree canopy cover an containing both row crops, active eed lots, trails, or **Buffers** on-maintained understory. Wetland layer (dbh > 3 inches) present, understory present, tree herbaceous and recently seeded ther comparable Recent cutove with <30% tree stratum (dbh >3 shrub layers or a non-maintained and stabilized, o conditions. (dense vegetation). canopy cover. inches) present, with <30% tree understory canopy cover with maintained High High High Low Low Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank 1.5 Score > CI= (Sum % RA \* Scores\*0.01)/2

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

100%

1.5

THE REACH CONDITION INDEX (RCI) >>

Rt Bank CI >

Lt Bank CI >

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

1.50

1.50

CI

1.50

0.75

CR = RCI X LF X IF

100%

INSERT PHOTOS:

Left Bank

% Riparian Area>

Score >



View of stream from railroad

NC DWQ Stream Identification Form Version 4.11

04-STR-04

Date: 12/3/2015	Project/Site: DC2RVA - Area 04	Latitude: 38.132542
Evaluator: D. Mitchell, M. Rockwell	County: Spotsylvania	Longitude: -77.426433
<b>Total Points:</b> 13 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Ditermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 4)	Absent	W <u>e</u> ak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	<u> </u>	1	2	3
7. Recent alluvial deposits		1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	o = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual			-	
B. Hydrology (Subtotal = $5$				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris		0.5	1	1.5
16. Organic debris lines or piles	0	0.5	(1) -	1.5
17. Soil-based evidence of high water table?	No	0 = C	Yes	= 3
C. Biology (Subtotal = 4)			$\sim$	
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	8	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other meth	ods. See p. 35 of manua	al.		
Notes: Field Sheet 11-STR-3.				

		Stre			sment Methodology f		) (For	m 1)			
			For use in	wadeable chan	nels classified a	s intermittent or	perennial		Inner a st/CAD	lana a at	
Project #		Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor	
N/A	DC2	RVA - Segme	nt 11	VA	R2	02080105	12/3/2015				
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
D. Mito	chell, M. Ro	ockwell				04-S	ΓR-05				
I. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal c	Conditional Catego	ry ginal	Po	or	Sev	ere	
	V	W.	1		Often incised, but	less than Severe or	Overwiden	ed/incised.	1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars, are present. Acce floodplain or fully bankfull benches. and transverse ba	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60-Depositional feat stability. The bar channels are wellikely has access to or newly develope portions of the r	ew areas of active ted banks. Majority table (60-80%). tion or natural rock 80%) AND/OR ures contribute to ktfull and low flow Il defined. Stream to bankfull benches, d floodplains along each. Transient \$ 10-40% of the	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositiv stability, may be	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present. de channels have	widen further. Maj	ority of both banks crosion present on ks. Vegetative to 10-40% of fficient to prevent R 60-80% of the ad by sediment. orary/transient in outing to instability. ad channels have	Deeply incised vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious bank slerosion/raw bar AND/OR. Aggradin	stability. Severe tained within the ad below average hajority of banks ut. Vegetative on less than 20% of eventing erosion. Dughing present. ks on 80-100%.	
	10% of	bottom.		bottom.	vegetative protecti banks and depositi	ion on > 40% of the ional features which to stability.	40% of the bar	nks and stable	than 80% of stream deposition, contrib Multiple thread subterran	uting to instability.	
Score	;	3	2	.4	:	2	1.	6	1	ı	
NOTES>> 2. RIPARIAI	N BUFFERS: /	Assess both bank	•	an areas along the	· · ·			th may be accep	table)		
	Opt	imal		ditional Categorial Categorial Categorial Categorial Categorian Categorial Categorian Ca		ginal	Po	or	NOTES>>	Watland 2	
Riparian Buffers	Tree stratum (dbh : with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutver (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	Flows into	Wetland 2	
Condition		-									
lescriptors. . Determine so elow.	quare footage for e  Riparian Area and  % Riparian Area>  Score >	each by measurin	g or estimating le	ngth and width. (	Calculators are pr		O.6  Ensure to of % R  Blocks en	iparian			
	1								CI= (Sum % RA * S	cores*0.01)/2	
Left Bank	% Riparian Area>	10%	90%					100%	Rt Bank CI >	1.11	
	Score >	0.85	1.2						Lt Bank CI >	1.17	
	M HABITAT: Va	iffle poole comple	exes, stable featu	res. Conditiona	I Category				NOTES>>	•	
Habitat/		imal	Stable habitat ele	ptimal ments are typically	Stable habitat ele	ginal ments are typically	Po Habitat elements	listed above are			
Available		re typically present		% of the reach and		% of the reach and r maintenance of	lacking or are un	nstable. Habitat ally present in less			
Cover	in greater than 5	0% of the reach.	are adequate fo							ļ <del>-</del>	
	_	.5	popul	ations.	popul	ations.	than 10% o	f the reach.			

	St	ream In	npact A	ssessm	ent For	m Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2	02080105	12/3/2015	04-STR-05			
4. CHANNEL	L ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of ch	hannel, channeliz	ation,	NOTES>>	•	
embankments, s	poil piles, constrictions, livestock		Conditiona	I Category						
	Negligible	Mi	nor		erate	Sev	rere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	10% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or eent.			CI
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			1.30
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			
NOTE: The CIs and R	RCI should be rounded to 2 decimal places. T	The CR should be roun	ided to a whole numb	er.				CONDITION INI		
								I= (Sum of all C ON REQUIREN		0
								I X LF X IF	"ENT (UK) >>	U
INSERT PHO	OTOS:									
DESCRIBE F	PROPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11

04-STR-05

Date: 12/3/2015	Project/Site: DC2RVA - Area 04	Latitude: 38.130797
Evaluator: D. Mitchell, M. Rockwell	County: Spotsylvania	Longitude: -77.424383
<b>Total Points:</b> 31.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitted Perennial	Other e.g. Quad Name:

Absent	Weak	Moderate	Strong
0	1	(2)	3
0	1	(2)	3
0		2	3
0			
0	1	(2)	3
(0)	1	2	3
0	(1)	2	3
(0)	<u> </u>	2	3
0	1	2	3
0	0.5	1	1.5
	0.5	1	1.5
No	0 = 0	Yes:	= 3
0	1	2	3
0	(1)	2	3
1.5	$\overline{(1)}$	0.5	0
0	0.5	1	1.5
0	0.5	1	(1.5)
No	0 = 0	Yes:	= 3
3	(2)	1	0
(3)	2	1	0
8	(1)	2	3
0	(1)	2	3
0	0.5	1	1.5
0	0.5	1	1.5
0	0.5	1	1.5
0	0.5	1	1.5
	FACW = 0.75;	OBL = 1.5 Other = 0	)
ds. See p. 35 of manua			
·			
	w	etland 2	
	and the same of		
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	0 1 2 0 1 2 0 0 1 2 0 0 1 2 0 0 1 2 0 0 1 2 0 0 1 2 0 0 0 1 2 0 0 0 0

		Stre	Unif	fied Stream N	lethodology f	or use in Virg		m 1)			
D		D N			nels classified a	s intermittent or		045 "	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A Name	DC2F e(s) of Evaluate	RVA - Segme	nt 11 Stream Name	VA	R2SB	02080105	12/3/2015				
	hell, M. Ro	. ,	Stream Name	e and imorni	ation	04-5	ΓR-06				
	ondition: Asse		tion of the stream	and prevailing c	ondition (erosion		111 00				
	Opti				Conditional Catego		l Po	Poor		oro	
		مريد	The state of the s		1	5	1		Severe		
Channel Condition	Very little incision or 100% stable ban surface protection prominent (80-1) Stable point bard are present. Acce floodplain or fully bankfull benches, and transverse be sediment depositio 10% of i	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars, urs few. Transient n covers less than	erosion or unproted of banks are st Vegetative protect prominent (60-Depositional feat stability. The ban channels are well likely has access to or newly developer portions of the r sediment cover	ew areas of active ted banks. Majority table (60-80%). ion or natural rock 80%) AND/OR ures contribute to kifull and low flow I defined. Stream to bankfull benches, d floodplains along each. Transient s 10-40% of the bottom.	Poor. Banks more or Poor due to Ic Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran instability. Depositis stability, may be AND/OR V-shap vegetative protectibanks and depositi	less than Severe or stable than Severe stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40 n is covered by diment may be sisent, contribute on that contribute to forming/present. ed channels have ion on > 40% of the ional features which to stability.	widen further. Maji are near vertical. 60-80% of bani protection prese banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrit AND/OR V-shape vegetative protecti 40% of the bar	unstable. Likely to ority of both banks rorsoin present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ad by sediment. orary/transient in outing to instability. ad channels have on is present on > hks and stable	banks, is not pre Obvious bank sle Erosion/raw ban AND/OR Aggradin than 80% of strean deposition, contrib Multiple thread	stability. Severe tained within the do below average ajority of banks ut. Vegetative on less than 20% of venting erosion. sughing present. ks on 80-100%. g channel. Greater is bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	.6	subterran		3.0
NOTES>>			_			- 11-B-STR-0		-	'		
RIPARIAN	BUFFERS: A		Con	ditional Cate	gory		its of length & widt		NOTES>>	a al Ia	
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	- 3 inches) present, inopy cover and a derstory. Wetlands	High Suboptimat: Riparian areas with tree stratum (dbh > 3 inches) to present, with > 30% tree canopy cover and a containing both herbaceous and shrub layers or a reconstruction.		High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	Stream is f culvert nea Wetland 7.				
Condition		_	High	Low	High	Low	High	Low			
Delineate ripa escriptors. Determine squelow.	urian areas along of uare footage for e	each stream ban	g or estimating le	ngth and width. (	Calculators are pr	•	0.6  Ensure the of % R  Blocks en	iparian			
	% Riparian Area>	15%	85%	. The blocks belov			DIOCKS 60	100%			
Right Bank	Score >	1.2	1.5								
	% Riparian Area>	10%	90%					100%	CI= (Sum % RA * S Rt Bank CI >	cores*0.01)/2 1.46	CI
Left Bank	Score >	1.2	1.5						Lt Bank CI >	1.47	1.46
	/ HABITAT: Va				ody and leafy deb	oris; stable substr	ate; low embeded	lness; shade;	NOTES>>		
	root mats; SAV; ri	ille poole comple	exes, stable reatul	res. Conditiona	l Category						
Instream Habitat/	Opti	mal		ptimal		ginal	Po				
Available	Habitat elements a		present in 30-50%	ments are typically 6 of the reach and	present in 10-309	ments are typically % of the reach and	Habitat elements lacking or are un	stable. Habitat			
Score	in greater than 5		popula	r maintenance of ations.	popul	r maintenance of lations.	elements are typica than 10% of	f the reach.			CI
	1.	<b>5</b>	. 1	.2		.9	0.	h			1.50

#### **Stream Impact Assessment Form Page 2** Locality Cowardin Class HUC Data Point Project # Applicant Date SAR length Impact Factor R2SB 02080105 12/3/2015 04-STR-06 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by any of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. is disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has been guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not cement. guidelines. guidelines. recovered. recovered. CI SCORE 1.5 1.3 1.1 0.9 0.7 0.5 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

INSERT PHOTOS:

Top Left: View of stream from culvert under railroad

CR = RCI X LF X IF

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

Bottom Right: View of stream, looking toward culvert under railroad

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

NC DWQ Stream Identification Form Version 4.11

04-STR-06

Date: 12/3/2015	Project/Site: D0	C2RVA - Area 04	Latitude: 38.12	23328
Evaluator: D. Mitchell, M. Rockwell	County: Spotsy	/Ivania	Longitude: -77	'.417131
<b>Total Points:</b> 32.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determ Ephemeral Into	ination (circle one) ermitter († Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 12.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1)	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	( N	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 9)		<del>.</del>		
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1)_	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes	= 3
C. Biology (Subtotal = 10.75 )	·			
18. Fibrous roots in streambed	3_	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	7	1	(2)	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5		1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		ACW = 0.75 O	BL = 1.5 Other = 0	)
*perennial streams may also be identified using other met				
Notes: Wet 5 & 6 are railside & abut Stream 5.	Str 5 originates @ v	vhat appears to be	a seep, but could	be a buried
railroad culvert. Str5 enters Culverts 6 &	7 flowing under the	road and to WTL	7 where it becom	es braided.
Sketch: Wetland / railr	road s	eep wetland		t 11-STR-05
outvort Ch	Stream 5	culvert 7		
culvert 6	Wetland 7			

111

		Stre			ment Methodology f		1 (For	III I <i>)</i>			
					nels classified a				Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A		RVA - Segme		VA	R4SB	02080105	12/3/2015				
	e(s) of Evalua chell, M. Ro		Stream Nam	e and Informa	ation	04-S	ΓR-07				
	Condition: Asse		tion of the stream	and prevailing c	ondition (erosion.		11. 07				
		imal			Conditional Catego		Po	or	Sev	ere	
	11				7. X	9	N.		///	1	
		- MAR	V.			ess than Severe or	Overwidene		1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars, are present. Acce floodplain or fully bankfull benches, and transverse ba	or active erosion; 80- inks. Vegetative m or natural rock, 100%). AND/OR /bankfull benches sess to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	ew areas of active table (60-80%). tion or natural rock -80%) AND/OR urres contribute to okfull and low flow Il defined. Stream o bankfull benches, of floodplains along each. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe ewer bank slopes. seent on 40-60% of tative protection on Streambanks may creat. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	Vertically/laterally viden further. Maj are near vertical. E 60-80% of banl protection prese banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrik AND/OR V-shape	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the bed by sediment. orary/transient in outing to instability.	Deeply incised vertical/lateral incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank slc Erosion/raw ban	stability. Severe tained within the do below average tajority of banks ut. Vegetative in less than 20% of venting erosion. Sughing present. It is on 80-100%.	
		on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protection 40% of the bar	on is present on > iks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	CI
Score	;	3	2	.4		2	1.	6	1		
NOTES>>	N BUFFERS: /	Assess both bank	s's 100 foot riparia		sheets, GIS			h may be accep	table)		
	N BUFFERS: /	Assess both bank			e entire SAR. (ro			h may be accep	table)		
		Assess both bank	Con	an areas along the	e entire SAR. (roo	ugh measuremen					
	Opt  Tree stratum (dbh with > 60% tree cr		Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the	e entire SAR. (roo	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	ts of length & widt				
2. RIPARIAN Riparian Buffers	Opt  Tree stratum (dbh with > 60% tree cr	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbacoeus vegetatione with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
2. RIPARIAN	Opt  Tree stratum (dbh: with > 60% tree c. non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active fee lots, trails, or or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate ripa descriptors. 2. Determine squeedles.	Opt  Tree stratum (dbh: with > 60% tree c. non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate ripalescriptors. 2. Determine squeledw.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strain areas along quare footage for 6 Riparian Area and % Riparian Area	imal  > 3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate rips descriptors. Determine squelow. B. Enter the % F	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of t	imal  > 3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5		cores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate rips descriptors. Determine squelow. B. Enter the % F	Tree stratum (dbh: with > 60% tree c. non-maintained un located within th  1 arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	0.00	CI
Condition Scores  1. Delineate rips descriptors. 2. Determine squelow. 3. Enter the % F Right Bank  Left Bank  3. INSTREAN	Tree stratum (dbh: with > 60% tree ci non-maintained un located within th  1 arian areas along quare footage for e Riparian Area and % Riparian Area> Score > % Riparian Area> Score > M HABITAT: V	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Kinto Condition C g or estimating le parian category in	to a reas along the ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below by and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are province.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 0.5	NOTES>>  Cl= (Sum % RA * Si		C1 0.00
Condition Scores  1. Delineate ripz descriptors. 22. Determine squelow. 33. Enter the % F Right Bank  Left Bank  3. INSTREAN	Tree stratum (dbh: with > 60% tree ci. non-maintained un located within th  1  arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Kinto Condition C g or estimating le parian category in	can areas along the ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below the blocks below the part of the blocks below the blocks belo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are province.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 0.5	NOTES>>  Cl= (Sum % RA * S: Rt Bank Cl >  Lt Bank Cl >	0.00	
Condition Scores  1. Delineate rips descriptors. 2. Determine squelow. 3. Enter the % F Right Bank  Left Bank  3. INSTREAN	Tree stratum (dbh. with > 60% tree ci non-maintained un located within th located within th located within th strain areas along quare footage for e Riparian Area and % Riparian Area > Score > M HABITAT: W root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo	un areas along the ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below the blocks below the present conditional ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <20% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, traits conditions.  Low 0.5  Low 0.5  Low 0.6  0%  0%	NOTES>>  Cl= (Sum % RA * S: Rt Bank Cl >  Lt Bank Cl >	0.00	
Condition Scores  1. Delineate ripa descriptors. 2. Determine so polow. 3. Enter the % F Right Bank  Left Bank  3. INSTREAN undercut banks; Instream	Tree stratum (dbh. with > 60% tree ci non-maintained un located within th located within th located within th strain areas along quare footage for e Riparian Area and % Riparian Area > Score > M HABITAT: W root mats; SAV; r	imal  > 3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5  each stream ban each by measurin Score for each ri	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating leeparian category in the containing both herbaceous and shrub layers or a non-maintained understory.	conditional Cates ditional Cates ptimal Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Coungth and width. ( In the blocks below  by and depths; wores. Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel tolst, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 0.5  Low 0.5  Low 10.5  Lo	Cl= (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	0.00	

	St	ream In	npact A	ssessm	ent For	rm Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	csx		VA	R4SB	02080105	12/3/2015	04-STR-07			
4. CHANNE	L ALTERATION: Stream cross	ings, riprap, cond	crete, gabions, or	concrete blocks,	straightening of cl	hannel, channeliz	ation,	NOTES>>	<u>'</u>	
embankments, s	spoil piles, constrictions, livestock			al Category						
	Negligible	Mi	nor	40 - 60% of reach	erate 60 - 80% of reach	Sev	ere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter DR 80% of banks bion, riprap, or			CI
SCORE	1.5	1.3	1.1	0.9	0.7	0				
				TREAM CO	NDITION UN					
NOTE: The CIs and F	RCI should be rounded to 2 decimal places. T	The CR should be rou	nded to a whole numb	er.				CONDITION IN I= (Sum of all C		
								ON REQUIRE		0
INSERT PHO							CR = RC	I X LF X IF		1
						Bottom Righ				
				6						
DESCRIBE F	PROPOSED IMPACT:						-			

NC DWQ Stream Identification Form Version 4.11

04-STR-07

Date: 12/3/2015	Project/Site: DC2RVA - Area 04	Latitude: 38.107692
Evaluator: D. Mitchell, M. Rockwell	County: Spotsylvania	Longitude: -77.404908
<b>Total Points:</b> 0 Stream is at least intermittent if ≥ 19 or perennial if ≥ $30^*$	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	o = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal =)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	o = 0	Yes:	= 3
C. Biology (Subtotal =)	·		•	
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: NC data for this resource not available (no field sheets). Labeled in GIS in the field as intermittent, labeled in USGS National Hydrography Database Map as intermittent. GIS 11-B-STR-06.

FACW = 0.75; OBL = 1.5 Other = 0

Sketch:

26. Wetland plants in streambed

# Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

			For us	e in ephemeral s	treams				
Project #	Project Name	)	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Segme	nt 11	VA	R6	02080105	12/8/2015			
Name	e(s) of Evaluator(s)	Stream Nam	e and Informa	ation					
J. Bu	dnik, M. Rockwell			•	04-S7	TR-08	•		

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Cor	ditional Cate	gory				NOTES>>		
	Optimal	Subo	ptimal	Mar	ginal	Po	oor	Parts of W	etland 6	
Riparian Buffers	Tree stratum (dbh > 3 inches) presen with > 60% tree canopy cover and ar non-maintained understory. Wetland areas.	to 60% tree s canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparselly vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces row crops, active feed lots, trails, or other comparable conditions.	A-STR-06.		
		High	Low	High	Low	High	Low			
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5			
descriptors.	arian areas along each stream ba		· ·		· ·	Ensure	the sums			
<ol><li>Determine sq below.</li></ol>	uare footage for each by measuri	ng or estimating le	ngth and width. (	Calculators are pr	ovided for you	of % F	Riparian			
3. Enter the % F	Riparian Area and Score for each	riparian category i	n the blocks below	w.		Blocks 6	equal 100			
Right Bank	% Riparian Area> 10%	90%					100%			
<b>J</b>	Score > <b>0.85</b>	1.2								
								CI= (Sum % RA * \$		
Left Bank	% Riparian Area> 10%	90%					100%	Rt Bank CI >	1.17	С
	Score > <b>0.85</b>	1.5						Lt Bank CI >	1.44	1.3

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> 0.65 RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



View of stream facing away from railroad

NC DWQ Stream Identification Form Version 4.11

04-STR-08

Date: 12/8/2015	Project/Site: DC2RVA - Area 04	Latitude: 38.100144
Evaluator: J. Budnik, M. Rockwell	County: Caroline County	Longitude: -77.398831
<b>Total Points:</b> 13.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 4)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	<u>(1)</u>	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	(0)	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts		1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 4.5)	_			
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = $4.75$				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	<b>(</b> 0)	1	2	3
21. Aquatic Mollusks	<b>(0)</b>	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed			OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other method	· · · · · · · · · · · · · · · · · · ·			
Notes: Ephemeral stream originating at railroad	culvert. Field Sheet	11-STR-06-Tea	ım A.	

Sketch: ponded area debris

		Stre			ment Methodology f		-	m 1)			
					nels classified a				Impact/SAR	Impact	
Project #		Project Name	•	Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		RVA - Segme		VA	R2	02080105	12/8/2015				
	e(s) of Evalua		Stream Nam	e and Informa	ation	04.67	FD 00				
	dnik, M. Roc		C	1		04-S	K-09				
i. Channei C	Condition: Asse			C	Conditional Catego	ry					
	Opti	imal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	1	LAND MARKET	3		Often incised, but	less than Severe or	Overwiden	ed/incised.	1	5	
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse bar	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	Often Incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slope of banks. Anajority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream kely has access to bankfull benches, rorewly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.  Other incised, but less than Severe or Poor. Banks more stable than Severe or Poor. Banks more stable than Severe or Poor. Banks more stable than Severe or Poor. Banks more stable than Severe or Poor. Banks more stable than Severe or Poor. Banks more stable than Severe or Poor. Banks more stable than Severe or Poor. Banks may be present on 40-60% of banks. Vegetative protection on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to preven the poor to present on 20-40% of the stability. Deposition that contribute to stablify. Poposition that contribute to a transient sediment covers 10-40% of the banks and depositional features which contribute to stability. Deposition that contribute to transient sediment covers 10-40% of the banks and depositional features which contribute to stability. Deposition that contribute to stability. Deposition that contribute to stability. Deposition that contribute to stability. Apposition that contribute to stability. Poposition that contribute to st		banks, is not pre Obvious bank sle Erosion/raw ban	stability. Severe itained within the ad below average najority of banks ut. Vegetative on less than 20% of eventing erosion. bughing present.				
	sediment deposition 10% of	on covers less than bottom.	sediment cover	s 10-40% of the	vegetative protecti banks and depositi	on on > 40% of the ional features which	AND/OR V-shaped channels have electric protection is present of 40% of the banks and stable		than 80% of stream deposition, contrib Multiple thread subterran	n bed is covered by outing to instability. channels and/or	CI
Score	3		L	.4	I	2	1.		1		2.4
NOTES>>	Builto uro	ongridy in	oloca. Olla		ield Sheet 1			.p.a	tlands on e	itiloi sido.	
2. RIPARIAI	N BUFFERS: A	Assess both bank	k's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen		h may be accep	table)		
2. RIPARIAI	N BUFFERS: A	Assess both bank	•	an areas along the	· · ·	ugh measuremen		h may be accep	ntable)		
2. RIPARIAI	N BUFFERS: A		Con	*	gory	ginal	ts of length & wide		NOTES>> Wetlands a		
2. RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate	gory		ts of length & wide	Or  Low Poor:	NOTES>>	rian area. STR-05 ilroad jority is by at least	
Riparian Buffers	Option  Tree stratum (dbh swith > 60% tree canon-maintained und	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> Wetlands a within ripa Portion of borders rai ballast. Ma bordered b	rian area. STR-05 ilroad jority is by at least	
Riparian	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, righarian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.	NOTES>> Wetlands a within ripa Portion of borders rai ballast. Ma bordered b	rian area. STR-05 ilroad jority is by at least	
Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 2. Determine sobelow.	Tree stratum (dbh with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Wetlands a within ripa Portion of borders rai ballast. Ma bordered b	rian area. STR-05 ilroad jority is by at least	
Riparian Buffers  Condition Scores  1. Delineate ripiescriptors. 2. Determine scopelow.	Tree stratum (dbh with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of th	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Wetlands a within ripa Portion of borders rai ballast. Ma bordered b	rian area. STR-05 ilroad jority is by at least	
Riparian Buffers  Condition Scores  Delineate ripidescriptors. Determine scelow.	Tree stratum (dbh with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Wetlands a within ripa Portion of borders rai ballast. Ma bordered b	rian area. STR-05 ilroad jority is y at least over.	
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Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank	Tree stratum (dbh : with > 60% tree cc non-maintained une located within th  1. arian areas along a quare footage for e Riparian Area and % Riparian Area> Score >	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each ri  100%  1.5	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Wetlands a within ripa Portion of borders ra ballast. Ma bordered b 60% tree co	rian area. STR-05 ilroad jority is y at least over.	CI 1.35
Condition Scores  1. Delineate rip: descriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI	Tree stratum (dbh : with > 60% tree conon-maintained und located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.5  100% 1.2  arried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 80% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the condition ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Wetlands a within ripa Portion of borders rai ballast. Ma bordered b 60% tree co	rian area. STR-05 ilroad jority is y at least over.		
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	Tree stratum (dbh swith > 60% tree canon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5.5  each stream ban each by measurin 100% 1.5  100% 1.2  aried substrate si iffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in  interpretable in the condition of the condi	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Tategories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the condition ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Wetlands a within ripa Portion of borders ra ballast. Ma bordered b 60% tree co	rian area. STR-05 ilroad jority is y at least over.		
Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 2. Determine sciplow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks;	Tree stratum (dbh : with > 60% tree conon-maintained und located within th  1. arian areas along to the conon-maintained and within the conon area.	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each ri  100%  1.5  100%  1.2  aried substrate si iffle poole completimal	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le sparian category in sparian category i	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. (and the blocks below the blocks below the product of the blocks below the product	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  W.  In Category  Mary  Stable habitat ele	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substrations are typically ments are typically ments are typically ments are typically ments are typically processed to the substration of the	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  O.6  Ensure to of % R Blocks end Blocks end Blocks end Blocks end Habitat elements	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Wetlands a within ripa Portion of borders ra ballast. Ma bordered b 60% tree co	rian area. STR-05 ilroad jority is y at least over.	
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh : with > 60% tree conon-maintained und located within th  1. arian areas along to the conon-maintained and within the conon area.	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.5  100% 1.2  aried substrate si iffle poole completimal  re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in  in a category in  sees, stable featur  Subo  Stable habitat ele present in 30-50% are adequate fo	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (In the blocks below  by and depths; wores.  Conditiona ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided at Category  Mar.  Stable habitat ele present in 10-30% are adequate for are provided at Category  Mar.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you  pris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Wetlands a within ripa Portion of borders rai ballast. Ma bordered b 60% tree co	rian area. STR-05 ilroad jority is y at least over.	

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX VA			R2	02080105	12/8/2015	04-STR-09		
	ALTERATION: Stream cross poil piles, constrictions, livestock Negligible			al Category	straightening of ch		ation,	NOTES>> Some alter possible d	
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed	0% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or	railroad ba Oxbow ma other side railroad.	y exist on
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5	1	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View across stream Top Right: View away from tracks, railroad to the left Bottom Left: View of stream parallelling railroad Bottom Right: View toward railroad

NC DWQ Stream Identification Form Version 4.11

04-STR-09

Date: 12/8/2015	Project/Site: DC2RVA - Area 04	Latitude: 38.089536
Evaluator: J. Budnik, M. Rockwell	County: Caroline County	Longitude: -77.390631
<b>Total Points:</b> 53.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*		annitten Terenin	e.g. Quau Ivaine.	
A. Geomorphology (Subtotal = 25)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
Sinuosity of channel along thalweg	0	1	2	(3)
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	1	2	(3)
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 11 )				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	(1.5)
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = $17.75$ )				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	(3)
21. Aquatic Mollusks	0	1	2	(3)
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	(1.5)
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		EACW = 0.75	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method				
Notes: Mattaponi River. Wetlands 5 & 6 border riv	ver. Field Sheet 11	-STR-05-Team	A.	
Sketch:	Wetland 6 debris	debrits	railroad	

Wetland 5

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
Duration in		Dunie - t M			nels classified a			0.15."	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		RVA - Segme		VA	R2	02080105	12/7/2015				
	e(s) of Evalua Idnik, M. Roc	. ,	otream Nam	e and Informa	ation	U4-6.	TR-10				
	Condition: Asse		tion of the stream	and prevailing o	ondition (erosion		111-10				
. Onamer c					Conditional Catego	ry	Do		Sev		
	Opti	ımaı	Subo	ptimai	Iviar	ginal	Po	or	Sev	ere	
		WA PARKET	Slightly incised, for	Often incised, but less than Severe or Poor. Banks more stable than Severe			ınstable. Likely to	Deeply incised	(or excavated).		
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches.	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope		Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi			rosion present on as. Vegetative on 20-40% of fficient to prevent a 60-80% of the d by sediment. orary/transient in uting to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underd	stability. Severe tained within the delow average aportity of banks ut. Vegetative on less than 20% of venting erosion. Bughing present.	
	sediment deposition	full benches. Mid-channel bars, transverse bars few. Transient transverse bars few. Transient transverse bars few. Transient portions of the reach. Transient sediment covers 10-40% of the stream bottom.  In the first access to dark mid-to relication to literature. The stream bottom is stability. Deposition that contribute to stability. The position relication on the stability of the stability of the stability. The position that contribute to stability and the stability of the stability. The position is always the stability of the stability of the stability. The position is always the stability of the stability of the stability. The position is always the stability of the stability of the stability of the stability. The position is always the stability of the stability of the stability of the stability of the stability. The position is always the stability of th		on is present on > ks and stable	AND/OR Aggradin than 80% of stream deposition, contrib Multiple thread subterran	bed is covered by uting to instability. channels and/or	CI				
Score	3	3	2	.4		2	1.	6	1		2.4
NOTES>>				Fi	ield Sheet	11-A-STR-0	4.				
2. RIPARIAI	N BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt	h may be accep	table)		
2. RIPARIAI			Con	ditional Cate	gory				NOTES>>		
2. RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree		gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.			adjacent.	
Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>>	adjacent.	
Riparian	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>	adjacent.	
Riparian Buffers  Condition Scores  Delineate rip descriptors. 2. Determine so	Opti	imal  - 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  -5  -5  -6  -5  -5  -6  -6  -6  -6  -7  -7  -7  -7  -7  -7	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>	adjacent.	
Riparian Buffers  Condition Scores  Delineate ripiescriptors. 2. Determine scores	Tree stratum (dbh a with > 60% tree cc non-maintained una located within the located with	imal  3 inches) present, anopy cover and a derstory. Wellands e riparian areas.  5  each stream ban each by measuring Score for each r 100%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>	adjacent.	
Riparian Buffers  Condition Scores  Delineate rip. lescriptors. Determine scelow.	Tree stratum (dbh: with > 60% tree conon-maintained unclocated within the  1.  arian areas along in quare footage for e	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>		
Condition Scores  Delineate ripidescriptors. 2. Determine scielow. 3. Enter the % I	Tree stratum (dbh : with > 60% tree cc non-maintained une located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands derstory. Wetlands er iparian areas.  5  each stream ban each by measurin Score for each r 100% 1.2	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Wetland 3	cores*0.01)/2	CI
Condition Scores  1. Delineate ripiescriptors. 2. Determine scoelow. 3. Enter the % I	Tree stratum (dbh : with > 60% tree cc non-maintained une located within th  1. arian areas along a quare footage for e Riparian Area and % Riparian Area> Score >	imal  3 inches) present, anopy cover and a deferstory. Wellands e riparian areas.  5  each stream ban each by measurin  Score for each r  100%  1.2	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Wetland 3  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2	CI 1.20
Riparian Buffers  Condition Scores  Delineate riplescriptors. Determine scolelow. Right Bank  Left Bank  B. INSTREAL	Tree stratum (dbh : with > 60% tree cc non-maintained une located within the located with	imal  3 inches) present anopy cover and a derstory. Wetlands derstory. Wetlands er iparian areas.  5  each stream ban each by measurin 100% 1.2  100% 1.2  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Wetland 3	cores*0.01)/2	
Condition Scores  Delineate rip: descriptors. Descriptors. Right Bank  Left Bank  Left Bank  INSTREAL	Tree stratum (dbh swith > 60% tree canon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5.5  each stream ban each by measuring Score for each race of the stream ban 1.2  100% 1.2  arried substrate siffle poole complete.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable feature	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, conditions.  Low 0.5  Low 10.5   NOTES>> Wetland 3  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2		
Riparian Buffers  Condition Scores  Delineate rip: Jescriptors. Descriptors. Descri	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th  1. arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  M HABITAT: Va root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands to riparian areas.  5  each stream ban each by measurin Score for each r 100% 1.2  100% 1.2  arried substrate si iffle poole completimal	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo Stable habitat elei	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below the product of the blocks below the product	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  W.  In Category  Mar  Stable habitat ele	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substrations are typically ments are typically ments are typically ments are typically substrated in the control of the	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks end Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%	NOTES>> Wetland 3  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2	
Condition Scores  Delineate rip- descriptors. Delermine scoelow. Right Bank  Left Bank  I. INSTREAI undercut banks; Instream	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th  1. arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  M HABITAT: Va root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5.5  each stream ban each by measuring Score for each race to 100% 1.2  100% 1.2  arried substrate si fifte poole completimal  re typically present	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in the containing both and the containing both and containing both experience of the containing both experience of	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Tategories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrud layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High 0.85  Calculators are provided at Category w	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you  pris; stable substr	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  100%  100%  100%	NOTES>> Wetland 3  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2	

	St	ream In	npact A	ssessm	ent For	m Page	<b>2</b>		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	csx	VA	R2	02080105	12/7/2015	04-STR-10			
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock  Conditional Category  NOTES>>  Pipe, culverts,									
	Negligible	Mi	nor		erate	Sev	ere	beaver activity	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with ga cem	of the channel in the parameter PR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5		
	DEVCH C	ONDITION II	NDEY and S	TREAM CON	IDITION LIN	ITS EOD TH	IS DEVCH		

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View upstream Top Right: View downstream

Bottom Left: View upstream toward culverts under railroad Bottom Right: View downstream from culverts under railroad

NC DWQ Stream Identification Form Version 4.11

04-STR-10

Date: 12/7/2015	Project/Site: DC2RVA - Area 04	Latitude: 38.086822
Evaluator: J. Budnik, M. Rockwell	County: Caroline County	Longitude: -77.388481
<b>Total Points:</b> 47 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermitter Perennial	Other e.g. Quad Name:

0 0 0 0	1 1 1	2 2	(3)
0	· · · · · · · · · · · · · · · · · · ·	2	(3)
0	1		
		2	(3)
+	1	2	3
0	1	2	3
0	1	2	3
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0	0.5		1.5
0		1	1.5
No		Yes :	= 3
			)
			_
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1.5	1		0
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No			$\overline{}$
I .			
3	(2)	1	0
3	2	1	0
8	1	<b>(2)</b>	3
0	1		3
0	0.5	$\overline{\Box}$	1.5
0	0.5	1	1.5
0	0.5		1.5
0	0.5		1.5
	FACW = 0.75	OBL = 1.5 Other = 0	)
See p. 35 of manua			
W.	railroad		
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 0.5 0 0.5 0 0.5 No = 0  0 1 0 0.5 No = 0  0 1 0 1 0 1 1.5 1 0 0.5 0 0.5 No = 0  3 2 0 1 0 1 0 0.5 0 0.	0 1 2 0 0.5 1 0 0.5 1 0 0.5 1 No = 0 Yes =  0 1 2 0 1 2 1.5 1 0.5 0 0.5 1 0 0.5 1 No = 0 Yes =  3 2 1 0 1 2 0 1 2 1.5 1 0.5 0 0.5 1 0 0.5 1 0 0 0.5 1 0 0 1 2 0 1 3 0 1

,	DC2RV s) of Evaluaton nik, M. Rockv	` '		wadeable chan	nels classified a	s intermittent or	noronnial				
N/A Name(s J. Budn	DC2RV s) of Evaluaton nik, M. Rockv ndition: Assess	/A - Segme r(s)		Locality				045 "	Impact/SAR	Impact	
Name(s J. Budn	s) of Evaluator nik, M. Rockv ndition: Assess	r(s)	nt 11		Class.	HUC	Date	SAR #	length	Factor	
J. Budn	nik, M. Rockv	` '	nt 11 Stream Name	VA	R2SB	02080105	12/7/2015				
	ndition: Assess	well	Stream Name	and informa	ation	04-STR-11					
_			tion of the stream	and prevailing or	andition (erosion		11 11				
			Subo	С	onditional Categor		Po	or	Sev	oro	
	· W		Subo	Juliai	Iviar	giriai	1		Jev	//	
	" was		Slightly incised, few areas of active		Often incised, but less than Severe or Poor. Banks more stable than Severe		Overwidened/incised. Vertically/laterally unstable. Likely to		Deeply incised	(or excavated).	
Condition :	100% Stable Daliks. Vegetative		aracian or unprotected banks. Majority		Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporaryltransient, contribute instability. Deposition that contribute to		60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability.		Septical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank slounding nesent.		
	ediment deposition of 10% of bott	covers less than	portions of the re sediment covers stream	s 10-40% of the	AND/OR V-shape vegetative protecti banks and depositi	forming/present. ed channels have ion on > 40% of the ional features which to stability.	AND/OR V-shape vegetative protection 40% of the band sediment depos	on is present on > ks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	CI
Score	3		2.	4	:	2	1.	6	1		2.4
NOTES>>				Fi	ield Sheet 1	11-A-STR-0	3.				
. RIPARIAN E	BUFFERS: Ass	sess both bank				ugh measuremen	ts of length & widt				
	Optima	al		Conditional Category Suboptimal Ma		ginal Poor			NOTES>>	riginates	
Buffers no	ree stratum (dbh > 3 i with > 60% tree cano pn-maintained under located within the rij	inches) present, py cover and a story. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazze pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	Stream 3 originates at railroad culvert.		
			High	Low	High	Low	High	Low			
Condition Scores	1.5		1.2	1.1	0.85	0.75	0.6	0.5			
escriptors. Determine squarelow.	an areas along each	h by measuring	g or estimating ler	ngth and width. (	Calculators are pro		Ensure the of % Ri	parian			
Right Bank	6 Riparian Area>	10% 0.85	90%					100%			
0/	6 Riparian Area>	10%	90%					100%	CI= (Sum % RA * So Rt Bank CI >	cores*0.01)/2	CI
Left Bank	Score >	0.85	1.2					.0070	Lt Bank CI >	1.17	1.17
	HABITAT: Varie				ody and leafy deb	oris; stable substr	ate; low embeded	ness; shade;	NOTES>>		
	ot mats; SAV; riffle	e poole comple	mplexes, stable features.  Conditiona		Il Category						
Instream Habitat/	Optima	Optimal Suboptimal		Marginal  Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of		Poor  Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less					
	riabilat didiriorità are typically proces		Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of								
Score	populations. 1.5 1.2		populations. than 10% of the reach.  0.9 0.5			the reach.		i	1.50		

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Date Data Point SAR length Impact Factor Project # CSX R2SB 02080105 12/7/2015 04-STR-11 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Channel is very straight. Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed i srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. CI SCORE 1.5 0.5 1.3 1.1 0.9 0.7 1.30

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### **INSERT PHOTOS:**



Top Left: View of culvert under railroad Top Right: View downstream from railroad Bottom Left: View upstream toward railroad

Bottom Right: View downstream

NC DWO Stream Identification Form Version 4.11

04-STR-11

1.5

FACW = 0.75 OBL = 1.5 Other = 0

Date: 12/7/2015	Project/Site: DC2RVA - Area 04	Latitude: 38.081422
Evaluator: J. Budnik, M. Rockwell	County: Caroline County	Longitude: -77.384153
<b>Total Points:</b> 41.5 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermitter Perennial	Other e.g. Quad Name:

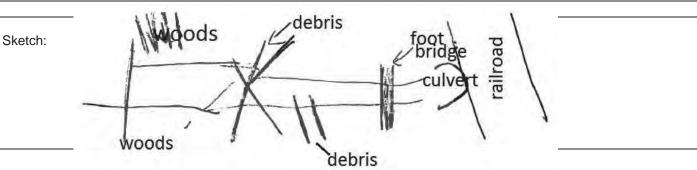
Continuity of channel bed and bank	if $\geq$ 19 or perennial if $\geq$ 30*	Epnemeral Inte	ermittent Perenni	e.g. Quad Name:	
Continuity of channel bed and bank   0	A. Geomorphology (Subtotal = 18	Absent	Weak	Moderate	Strong
Sinuosity of channel along thalweg	1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	
ripple-pool sequence Particle size of stream substrate  0 1 2 3 Active/relict floodplain 0 1 2 3 Recent alluvial deposits 0 1 2 3 Recent alluvial deposits 0 1 2 3 Recent alluvial deposits 0 1 2 3 Recent alluvial deposits 0 1 2 3 Recent alluvial deposits 0 0 1 2 3 Recent alluvial deposits 0 0 1 2 3 Recent alluvial deposits 0 0 1 2 3 Recent alluvial deposits 0 0 1 2 3 Recent alluvial deposits 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sinuosity of channel along thalweg	0	1	(2)	3
Active/relict floodplain   0	In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Depositional bars or benches   0	Particle size of stream substrate	0	1	(2)	3
Recent alluvial deposits	5. Active/relict floodplain	0	(1)	2	3
Headcuts	6. Depositional bars or benches	0	1	2	3
Grade control 0 0 0.5 1 1.5  D. Natural valley 0 0 0.5 1 1.5  D. Natural valley 0 0 0.5 1 1.5  D. Natural valley 0 0 0.5 1 1.5  D. Second or greater order channel No = 0 Yes = 3  D. Hydrology (Subtotal = 9.5)  D. Presence of Baseflow 0 1 2 3  D. Presence of Baseflow 0 1 2 3  D. Presence of Baseflow 0 0 1 2 3  D. Sediment on plants or debris 0 0.5 1 1.5  D. Sediment on plants or debris 0 0.5 1 1.5  D. Organic debris lines or piles 0 0.5 1 1.5  D. Soil-based evidence of high water table? No = 0 Yes = 3  D. Biology (Subtotal = 14 )  D. Rooted upland plants in streambed 3 2 1 0  D. Macrobenthos (note diversity and abundance) 0 1 2 3  D. Macrobenthos (note diversity and abundance) 0 1 2 3  D. Aquatic Mollusks 0 0 1.5 1 1.5  D. Crayfish 0 0.5 1 1.5	7. Recent alluvial deposits	0		2	3
1.	8. Headcuts	0	1	2	3
No = 0   Yes = 3   Artificial ditches are not rated; see discussions in manual   Yes = 3   Yes	9. Grade control	0	0.5	1	1.5
Artificial ditches are not rated; see discussions in manual  . Hydrology (Subtotal = 9.5  2. Presence of Baseflow  0 1 2 3  3. Iron oxidizing bacteria  4. Leaf litter  1.5 1 0.5 0  5. Sediment on plants or debris  0 0.5 1 1.5  6. Organic debris lines or piles  7. Soil-based evidence of high water table?  8. Biology (Subtotal = 14	10. Natural valley	0	0.5	1	1.5
Hydrology (Subtotal = 9.5   2   3   3   3   1   2   3   3   3   3   3   4   4   4   5   5   5   5   5   5   5	11. Second or greater order channel	No	0 = 0	Yes:	= 3
2. Presence of Baseflow  2. Presence of Baseflow  3. Iron oxidizing bacteria  4. Leaf litter  5. Sediment on plants or debris  6. Organic debris lines or piles  7. Soil-based evidence of high water table?  8. Biology (Subtotal = 14  9. Rooted upland plants in streambed  9. Rooted upland plants in streambed  10. Macrobenthos (note diversity and abundance)  11. Aquatic Mollusks  12. 3  34. Leaf litter  1.5 1  0.5 0  0.5 1  1.5  1.5  1.5  1.5  1.5  1.5  1.5	a artificial ditches are not rated; see discussions in manual				
3. Iron oxidizing bacteria  4. Leaf litter  5. Sediment on plants or debris  6. Organic debris lines or piles  7. Soil-based evidence of high water table?  8. Biology (Subtotal = 14)  8. Fibrous roots in streambed  9. Rooted upland plants in streambed  10. Macrobenthos (note diversity and abundance)  11. Aquatic Mollusks  12. Fish  13. Crayfish  14. Leaf litter  15. 10. 0.5  0. 0.5  1	B. Hydrology (Subtotal = $9.5$ )				
4. Leaf litter  4. Leaf litter  5. Sediment on plants or debris  6. Organic debris lines or piles  7. Soil-based evidence of high water table?  8. Biology (Subtotal = 14	12. Presence of Baseflow	0	1	2	(3)
5. Sediment on plants or debris 6. Organic debris lines or piles 7. Soil-based evidence of high water table? 8. Biology (Subtotal = 14	13. Iron oxidizing bacteria	0	1)	2	3
6. Organic debris lines or piles       0       0.5       1       1.5         7. Soil-based evidence of high water table?       No = 0       Yes = 3         8. Biology (Subtotal = 14)       3       2       1       0         9. Rooted upland plants in streambed       3       2       1       0         9. Rooted upland plants in streambed       3       2       1       0         9. Macrobenthos (note diversity and abundance)       0       1       2       3         1. Aquatic Mollusks       0       1       2       3         2. Fish       0       0.5       1       1.5         3. Crayfish       0       0.5       1       1.5	14. Leaf litter	1.5	1	0.5	0
7. Soil-based evidence of high water table?  8. Biology (Subtotal = 14 )  8. Fibrous roots in streambed  9. Rooted upland plants in streambed  10. Macrobenthos (note diversity and abundance)  11. Aquatic Mollusks  12. Fish  13. Crayfish  No = 0  Yes = 3  Yes = 3  Yes = 3  Yes = 3  1	15. Sediment on plants or debris	0	0.5	1	1.5
3. Biology (Subtotal = 14 )       3       2       1       0         3. Fibrous roots in streambed       3       2       1       0         4. Rooted upland plants in streambed       3       2       1       0         5. Macrobenthos (note diversity and abundance)       0       1       2       3         1. Aquatic Mollusks       0       1       2       3         2. Fish       0       0.5       1       1.5         3. Crayfish       0       0.5       1       1.5	16. Organic debris lines or piles	0	0.5		
3. Fibrous roots in streambed       3       2       1       0         9. Rooted upland plants in streambed       3       2       1       0         9. Rooted upland plants in streambed       3       2       1       0         9. Macrobenthos (note diversity and abundance)       0       1       2       3         1. Aquatic Mollusks       0       1       2       3         2. Fish       0       0.5       1       1.5         3. Crayfish       0       0.5       1       1.5	17. Soil-based evidence of high water table?	No	o = 0	Yes :	= 3
9. Rooted upland plants in streambed       3       2       1       0         9. Rooted upland plants in streambed       0       1       2       3         1. Aquatic Mollusks       0       1       2       3         2. Fish       0       0.5       1       1.5         3. Crayfish       0       0.5       1       1.5	C. Biology (Subtotal = 14 )				
0. Macrobenthos (note diversity and abundance)       0       1       2       3         1. Aquatic Mollusks       0       1       2       3         2. Fish       0       0.5       1       1.5         3. Crayfish       0       0.5       1       1.5	18. Fibrous roots in streambed	3	(2)	1	0
1. Aquatic Mollusks     0     1     2     3       2. Fish     0     0.5     1     1.5       3. Crayfish     0     0.5     1     1.5	19. Rooted upland plants in streambed	(3)	2	1	0
2. Fish     0     0.5     1     1.5       3. Crayfish     0     0.5     1     1.5	20. Macrobenthos (note diversity and abundance)	7	1	<b>(2)</b>	3
3. Crayfish 0 0.5 1 1.5	21. Aquatic Mollusks	0	1	(2)	3
· · · · · · · · · · · · · · · · · · ·	22. Fish	0	0.5		1.5
1. Amphibians 0 0.5 1 1.5	23. Crayfish	0	0.5	1	1.5
	24. Amphibians	0	0.5		1.5

\*perennial streams may also be identified using other methods. See p. 35 of manual.

25. Algae

26. Wetland plants in streambed

Notes: Fish are likely present due to stream size. Field Sheet 11-STR-03-Team A.



Optimal Suboptimal High Suboptimal Use Suboptimal High Subopti		Ephe	mera			ssess			(For	m 1a)		
Project # Project Name				Uni				ginia				
Name(s) of Evaluator(s)  L. Eggering, R. Porath  Conditional Category  Conditional Categ	Project #		Project Name	•		Cowardin		Date	SAR#			
L. Eggering, R. Porath  Optimal Suboptimal Marginal Poor Pages and Suboptimal Washington Catagory  Optimal Suboptimal Washington Catagory  Optimal Page Advanced Marginal Pages And Catagory Suboptimal Washington Catagory  Institute of the Catagory  Institute of the Catagory  Institute of the Catagory  Institute of the Catagory  Institute of the Catagory  Institute of the Catagory  Institute of the Catagory  Institute of the Catagory  Institute of the Catagory  Institute of the Catagory  Institute of the Catagory  Institute of the Catagory  Institute of the Catagory  Institute of the Catagory  Institute of the Catagory  Institute of the Catagory  I	N/A	DC2	RVA - Segme	nt 11	VA	R6	02080105	08/10/2016			1	
Conditional Category    Continue   Category   Continue   Category	Name	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
Optimal   Suboptimal   High	L. Egg	gering, R. I	Porath				04-S <sup>-</sup>	ΓR-12				
Conditional Category    Committee   Conditional Category   Condition	DIDADIAN	L DUEEEDO.										
Condition   Scores   1.5   1.2   1.1   0.85   0.0	. RIPARIAN	N BUFFERS: /	Assess both bank				ugh measuremen	ts of length & wid	th may be accept			
Riparian Burfers  Concretion  1.5 1.2 1.1 0.85 0.75 0.6 0.5 Endure summer forms the form of the concretion of the concre		Ont	imal				ninal	Pr	oor			
The statum (Bith -3 sinches) present, procedure, with days and the statum of the statu		Орг	illiai	High Suboptimal: Riparian areas with tree stratum	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches)	High Marginal: Non-maintained, dense herbaceous	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas	High Poor: Lawns, mowed, and maintained areas, nurseries;	Low Poor: Impervious	riparian but	fer is of mixed	
Condition  1.5  1.2  1.1  0.85  0.75  0.6  0.5  Delineate ripartian arrans along each stream bank into Condition Calegories and Condition Scores using the scenptors.  Determine square footage for each by measuring registaling length and width. Calculations are provided for you elsew.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartian Area and Score for each ripartian category in the blocks below.  Enter the % Ripartia	•	with > 60% tree ca non-maintained un	nopy cover and an derstory. Wetlands	to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	>30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Scores 1.3 1.2 1.1 0.85 0.75 0.6 0.5  1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  3. Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank	Condition			Ū	Low	High	Low	High	Low			
Right Bank   Score   1.2   S		1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
Right Bank Score > 1.2 Circ (Sum % RA * Scores* 0.01)/2.  Left Bank W. Repartin Areas 100% 100% Rt Bank Cl > 1.20  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  OTE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCl) >> RCl= (Ripartian Cl)/2  COMPENSATION REQUIREMENT (CR) >> CR = RCl X LF X IF  NSERT PHOTOS:	lescriptors. 2. Determine squelow.	uare footage for e	each by measurin	g or estimating le	ngth and width. (	Calculators are pr	•	of % F	Riparian			
Score > 1.2  Left Bank Score > 1.2  Left Bank Score > 1.2  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  WOTE: The Cis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  INSERT PHOTOS:	Right Bank								100%			
Left Bank	-	Score >	1.2							Cl= (Sum % RA * S	cores*0.01\/2	-
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  NSERT PHOTOS:		% Riparian Area>	100%						100%			C
THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  NSERT PHOTOS:	Left Bank											1.3
RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  NSERT PHOTOS:			REACH C	ONDITION I	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			
RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  NSERT PHOTOS:	OTE: The CIs and F	RCI should be rounded	to 2 decimal places. 1	The CR should be rour	nded to a whole numb	er.			THE REACH O	CONDITION IND	EX (RCI) >>	0.0
CR = RCI X LF X IF  NSERT PHOTOS:											, ,	
NSERT PHOTOS:									COMPENSATI	ON REQUIREM	ENT (CR) >>	
DESCRIBE PROPOSED IMPACT:	NSERT PHO	0108:										
	DESCRIBE F	PROPOSED IN	//PACT:									
	DECOMBE F	NOI OGED IN										

Project/Site: DC2RVA - Area 04

NC DWQ Stream Identification Form Version 4.11

Date: 08/10/2016

04-STR-12

Latitude: 38.078060

Evaluator: L. Eggering, R. Porath	County: Carolin	е	Longitude: -77.381323	
<b>Total Points:</b> 8.5 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 4.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = $1.0$ )				
12. Presence of Baseflow	0	1	2	3
		1	2	3
13. Iron oxidizing bacteria	1.5	1	<u>(0.5)</u>	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	<u></u>	1.5
17. Soil-based evidence of high water table?		0 = 0	Yes:	_
C. Biology (Subtotal = 3.0 )	110		103	
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	Ö
20. Macrobenthos (note diversity and abundance)	Ö	1	2	3
21. Aquatic Mollusks		1	2	3
22. Fish		0.5	1	1.5
23. Crayfish		0.5	1	1.5
24. Amphibians		0.5	<u>'</u> 1	1.5
		0.5	(1)	1.5
25. Algae	0			
26. Wetland plants in streambed		FACW = 0.75; OBI	L = 1.5 Other = 0	<u> </u>
*perennial streams may also be identified using other method				
Notes: Dry streambed. The riparian buffer is com	iprised of mixed har	rawood and pine.		
Sketch:				

			am A	fied Stream M			_				
			For use in	wadeable chan		s intermittent or	perennial				
Project #	ı	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area		VA	R4SB	02080105	12/7/2015				
	e(s) of Evalua	. ,	Stream Nam	e and Informa	ation	04 61	R-13a				
	Idnik, M. Roc		tion of the atroom	and provoiling o	andition (arasian		K-13a				
. Channel C				C	Conditional Catego	ry			1 0		
	Opti	imal	Subo	ptimal	Mar	ginal	Poor		Sev	ere	
	1	- MAP	The state of the s		Often incised, but less than Severe or		Overwidene		1	5	
Channel Condition	surface protection prominent (80-1 Stable point bars/	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow Il defined. Stream o bankfull benches, d floodplains along	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe were bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	Vertically/laterally widen further. Maj are near vertical. E 60-80% of banl protection prese banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the d by sediment. orary/transient in uting to instability.	vertical/linteral in incision, flow corbanks. Streambe rooting depth, m vertical/underco protection present obanks, is not pre Obvious bank sle Erosion/raw bank	stability. Severe tained within the ed below average hajority of banks ut. Vegetative on less than 20% of eventing erosion. Doughing present. ks on 80-100%.	
		on covers less than	sediment cover	reach. Transient rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protectic 40% of the ban sediment depos	on is present on > ks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	
Score	3	3	2	.4		2	1.	6	1		
NOTES>>		Banks	are define	ed and vege	etated. Cha	nnel is sma	III. Field Sh	eet 11-A-S	STR-01.		
	N BUFFERS: A	Assess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep			
	N BUFFERS: /	Assess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen		h may be accep	table)	at railroad	
	Opti	Assess both bank imal  > 3 inches) present, anderstory. Wetlands	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep	ntable)	at railroad	
Riparian Buffers	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th	Assess both bank imal  > 3 inches) present, anderstory. Wetlands	Con Subo Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorium Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ripanian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Originates	at railroad	
Riparian Buffers  Condition Scores  Delineate rip descriptors. 2. Determine so helow.	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin Score for each r 10%	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 90%	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tweth < 30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Originates	at railroad	
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Riparian Buffers  Condition Scores Delineate rip descriptors. Determine scelow. B. Enter the %	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin Score for each r 10% 0.85	C's 100 foot ripariat  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le  parian category in  90%  1.2	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tweth < 30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Originates culvert.  Cl= (Sum % RA * S Rt Bank Cl >	cores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate rip descriptors. Determine scoledw. Enter the % Right Bank	Tree stratum (dbh a with > 60% tree co conon-maintained una located within the located wi	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands er iparian areas.  5  each stream ban each by measurin Score for each r 10% 0.85	Cs 100 foot ripariat  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in  90%  1.2	an areas along the ditional Categories and Congth and width. Categories and Congth and width. Categories and Congth and width. Categories and Congth and width. Categories and Congth and width. Categories and Congth and width. Categories and Congth and width. Can the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the second of the second	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies the seeded and stabilize	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums imparian qual 100 100%	NOTES>> Originates culvert.	cores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate rip descriptors. Determine scoelow. Right Bank  Left Bank  B. INSTREAL	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5  each stream ban each by measurin Score for each r 10% 0.85  10% 0.85  aried substrate si	C's 100 foot ripariat  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in  90%  1.2  90%  1.2  zes, water velocit	an areas along the ditional Categories and country and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Country and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the second of the second	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies the seeded and stabilize	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums imparian qual 100 100%	NOTES>> Originates culvert.  Cl= (Sum % RA * S Rt Bank Cl >	cores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate rip descriptors. Determine scoelow. Right Bank  Left Bank  B. INSTREAL	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5.5  each stream ban each by measurin  Score for each r  10%  0.85  10%  0.85  aried substrate si iffte poole comple	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 90% 1.2  2es, water velocit exes, stable feature	an areas along the ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below th	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (bdh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	Is of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Originates culvert.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2	
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Condition Scores Delineate rip Jescriptors. Deltermine scoelow. Right Bank Left Bank B. INSTREAL Indercut banks;	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th  1. arian areas along the strategy of the stratum (dbh : strategy of the strategy	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5.5  each stream ban each by measurin  Score for each r  10%  0.85  10%  0.85  iffle poole completimal  re typically present	Cs 100 foot riparia  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in 90% 1.2  2es, water velocit exes, stable featur  Subo  Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (6th > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Originates culvert.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	cores*0.01)/2	

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB	02080105	12/7/2015	04-STR-13a		
	ALTERATION: Stream cross poil piles, constrictions, livestock	sings, riprap, conc	rete, gabions, or Conditiona		straightening of ch	nannel, channeliz	zation,	NOTES>>	
	Negligible	Mir	nor	Mode	erate	Sev	/ere		
Channel		Less than 20% of the stream reach	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel alterations listed in	is disrupted by any of the channel	Greater than 8	30% of reach is		
Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	alterations listed guidelines AND/C	y of the channel in the parameter DR 80% of banks abion, riprap, or nent.		

# REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

# INSERT PHOTOS:



Top Left: View of culvert under railroad

Top Right: View of stream length including culvert under railroad

Bottom Left: View of stream length Bottom Right: View downstream

Project/Site: DC2RVA - Area 04

NC DWQ Stream Identification Form Version 4.11

Date: 12/7/2015

04-STR-13a

Latitude: 38.075017

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Weak		Strong  3 3 3 3 3 3 3 1.5 1.5 1.5 1.5 1.5 1.5
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<u>(0)</u>	0.5	2	3
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. 35 of manu		<u> </u>	<u>′</u>
		n bed. Field Sheet	
spoom debri	S		
1	Wetland v	Spood debris	EACW = 0.79; OBL = 1.5 Other = 0.35 of manual.  Wetland vegetation in stream bed. Field Sheet

Scores   1.2 1.1 0.85	N/A DC2RVA - Area 04 VA R6 02080105 1277/2015	N/A Nam J. Bu RIPARIAN	DC2RVA - A le(s) of Evaluator(s) lidnik, M. Rockwell  N BUFFERS: Assess both	rea 04	VA					length	Factor
Name(a) of Evaluator(s)  J. Budnik, M. Rockwell  Od-STR-13b  RIPARIAN BUFFERS: Assess both basin's 100 foot ripation areas along the entire SAR. (loogh measurements of largit A, sidth may be acceptable)  Conditional Category  Suboptimal  Happ Bosephase  Suboptimal  Happ Bosephase  Happ	Name(a) of Evaluator(s)  J. Budnik, M. Rockwell  Od-STR-13b  Od-STR-13b  RIPARIAN BUFFERS: Assess both banks 100 both speakers arous along the entire SAP. (rough measurements of lampth, 4 with may be acceptable)  Conditional Category  Conditional Category  Left Reparts  High Biologophists  Left Reparts  High Biologophists  High Morginal:  Left Reparts  High Morginal:  Left Reparts  Left Reparts  High Morginal:  Left Reparts  Left Reparts  Left Reparts  Left Reparts  Left Reparts  Left Reparts  Left Reparts  High Morginal:  Left Reparts  Left	J. Bu RIPARIAN	le(s) of Evaluator(s) Idnik, M. Rockwell N BUFFERS: Assess both				02080105	12/7/2015			
RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAE. (rough resouvements of length & width may be acceptable)  Conditional Category  High Suboprimal  Suboprimal  High Suboprimal  Fire dividual (libr) - 3 inching person, with the calculation of the control operand, with the calculation of the calculation o	RIPARIAN BUFFERS: Assess both bark's 100 foot riparian areas along the errine SAF. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Warginal Under Safety (region of the safety) (r	J. Bu	udnik, M. Rockwell  N BUFFERS: Assess both			ation	02000103	12/1/2010			
Conditional Category  Optimal Suboptimal Vegical Su	Conditional Category    Coptimal   Suboptimal   Warginal   Low Suboptimal   Right Budgetinal   Marginal   Right Budgetinal   Ri	Riparian					04-ST	R-13b			
Coptimal Suboptimal Law Suboptimal Williams (Law Suboptimal Figure 1 and Subop	Conditional Category    Comparison   Compari	parian		bank's 100 foot ripari.	an areas along the	e entire SAR (ro	ugh measuremen	ts of length & wid	th may be accept:	able)	
ingli Suboptimal fight	inglia Suboptimal figures and the sub-special part of		Optimal				-9	·-··g ·			
with the extraction with the extraction of the property of the	Page   Page			Subo	ptimal	Mar			oor		
modificion Scores 1.5 1.2 1.1 0.0 High Low High Low High Low High Low On the Color Scores Scores 1.5 1.2 1.1 0.0 High Low High Low High Low High Low On the Color Scores Using the Criticotes.  Seleviate in parian areas along each stream bank into Condition Categories and Condition Scores using the Criticotes.  Which we shall shall be considered for each by measuring or estimating length and width. Calculators are provided for you will be considered for each signature category in the blocks below.  Score > 0.5   Color Score	modificion Scores 1.5 1.2 1.1 1.0		with > 60% tree canopy cover a non-maintained understory. We	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% dan to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory.  Recent cutover (dense	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	vegetation mixture of herbaceou vegetation adjacent to that has fo area behind	that's a s directly channel rested d it. Field
Scores   1.5   1.2   1.1   0.85   0.75   0.85    Ensure the suns patients are along each stream bank into Condition Categories and Condition Scores using the scriptors.  Blocks equal 100    Blocks equal 100    Blocks equal 100    Chi (Sum % RA * Scores* 0.55   0.85	Scores   1.5   1.2   1.1   0.85   0.75   0.85    Ensure the suns patients are along each stream bank into Condition Categories and Condition Scores using the scriptors.  Blocks equal 100    Blocks equal 100    Blocks equal 100    Chi (Sum % RA * Scores* 0.55   0.85	Condition		High	Low	High		High	Low		
Determine square footage for each by measuring or estimating length and width. Calculators are provided for you will be determine square footage for each riparian category in the blocks below.  Blocks equal 100  Blocks equal 100  Circ (Sum % RA * Scores*0.01)/2  Left Bank  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE Cis and RCI should be rounded to 2 decimal places. The Cit should be rounded to a whole number.  THE REACH CONDITION REQUIREMENT (CR) >> CR = RCI X LF X IF	Determine square footage for each by measuring or estimating length and width. Calculators are provided for you will be determine square footage for each riparian category in the blocks below.  Blocks equal 100  Blocks equal 100  Circ (Sum % RA * Scores*0.01)/2  Left Bank  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE Cis and RCI should be rounded to 2 decimal places. The Cit should be rounded to a whole number.  THE REACH CONDITION REQUIREMENT (CR) >> CR = RCI X LF X IF	Scores						0.6	0.5		
cft Bank   Score   100%   R Bank Cl   0.50   0.85   Lt Bank Cl   0.85    REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.    THE REACH CONDITION INDEX (RCI) >>	eft Bank   Score   100%   100%   R Bank Cl   0.50   0.85   Lt Bank Cl   0.85    REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to 3 whole number.  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to 3 whole number.  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to 3 whole number.  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to 3 whole number.  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to 3 whole number.  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to 3 whole number.  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to 3 whole number.  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to 3 whole number.  E. The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to 3 whole number.  E. The Cls and RCI should be rounded to 2 decim	criptors. Determine so ow. Enter the % F	quare footage for each by mea  Riparian Area and Score for e  % Riparian Area> 100%	suring or estimating le	ength and width. (	Calculators are pr	•	of % F	Riparian equal 100		
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE Cla and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  ERT PHOTOS:	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE Cla and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  ERT PHOTOS:		Score > 0.3							CI= (Sum % RA * Se	cores*0.01)/2
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  ERT PHOTOS:	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  ERT PHOTOS:	eft Bank		1					100%	<b>-</b>	
The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  ERT PHOTOS:	The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.    THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2			H CONDITION I	NDFX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH	21 24111 917	0.00
RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  ERT PHOTOS:	RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	The CIs and F								ONDITION IND	EX (RCI) >>
CR = RCI X LF X IF  ERT PHOTOS:	CR = RCI X LF X IF  ERT PHOTOS:										• •
ERT PHOTOS:	ERT PHOTOS:										ENT (CR) >>
	CRIBE PROPOSED IMPACT:	RT PHO	OTOS:						CR = RUI	X LF X IF	
SCRIBE PROPOSED IMPACT	SAMELY NOT COLD INIT NOT.	SCRIBE I	PROPOSED IMPACT:								

Project/Site: DC2RVA - Area 04

NC DWQ Stream Identification Form Version 4.11

Date: 12/7/2015

04-STR-13b

Latitude: 38.074925

Budnik, M. Rockwell	County: Carolin	ne County	Longitude: -77	7.380328
		ination (circle one) ermittent Perennial	Other e.g. Quad Name:	
na			1	
phology (Subtotal = 1.5	Absent	Weak	Moderate	Strong
of channel bed and bank	(0)	1	2	3
channel along thalweg	<u></u>	1	2	3
structure: ex. riffle-pool, step-pool, sequence	0	1	2	3
of stream substrate	0	(1)	2	3
floodplain	0	1	2	3
l bars or benches	0	1	2	3
vial deposits	<b>(</b> 0)	1	2	3
	0	1	2	3
ol	0	0.5	1	1.5
ley		0.5	1	1.5
greater order channel	( No	0 = 0	Yes	= 3
s are not rated; see discussions in manual				
y (Subtotal = <u>5</u>		<u> </u>		
of Baseflow	0	1	2	3
ng bacteria	0	1	2	3
	1.5	1	0.5	0
on plants or debris	0	0.5	1	1.5
ebris lines or piles	0	0.5	1	1.5
evidence of high water table?	No	0 = 0	Yes	= 3
(Subtotal = <u>7.25</u> )	_			
ots in streambed	(3)	2	1	0
land plants in streambed	(3)	2	1	0
hos (note diversity and abundance)	Ø	1	2	3
ollusks	(ō)	1	2	3
	0	0.5	1	1.5
	(0)	0.5	1	1.5
s	0	0.5	1	1.5
	0	0.5	1	1.5
ants in streambed		FACW = 0.79; OB	L = 1.5 Other = 0	)
ams may also be identified using other methods. Se	ee p. 35 of manua	al.		
meral stream intersecting stream 1. Field	Sheet 11-STI	R-02-Team A.		
railroad		9 11 9		
	ка	iiroad ballas	t panks	
culvert	-			
stream				
	^			
stream \\\\\	1			
1111	1	Section 15		
1	vegetat	ed banks		
railroad culvert stream	m2 -	ilroad ballas  ed banks	t banks	

Project # Project Name	Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams											
NAME CONTROL - Area 04	Project #		Project Name	)		Cowardin		Date	SAR#			
Quitable Supporting Su	N/A	DC	C2RVA - Area	04	VA		02080105			longan		
Conditional Category    Continue   Conditional Category   Conditiona	Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Inform	ation	04.67	FD 44				
Optimal Suboptimal Sub							04-3	I K-14				
Optimal Suboptimal High Suboptimal Was in the azional with the azional wit	2. RIPARIAN	N BUFFERS:	Assess both bank				ugh measuremen	ts of length & wid	th may be accept			
Rigarian Buffers  The attention (6th is 3 kin/kap) pleased. Separate areas of the control of the		Opt	imal				ginal	Po	oor		eet is	
1.5   1.2   1.1   0.85   0.75   0.6   0.5     1. Definate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.		Tree stratum (dbh with > 60% tree ca non-maintained un	> 3 inches) present, inopy cover and an derstory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces row crops, active feed lots, trails, or other comparable conditions.	missing, info was filled ou aerials	ormation	
Delinate prigrain areas along each stream bank into Condition Categories and Condition Scores using the disactions.		1	5				ı	Ū		1		
Selecting to a square footage for each by measuring or estimating length and width. Calculators are provided for you only to the square footage for each fipatian category in the blocks below.    Right Bank												
Blocks equal 100   Blocks equal 100	descriptors. 2. Determine so	· ·			Ü		· ·					
Score   1.1   0.6		Riparian Area and							•			
Left Bank 3% Reparten Arters 75% 25% 100% Rt Bank Cl > 0.98 Cl Lt Bank Cl > 0.98 0.98  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCl) > 0.49  RCl= (Riparien Cl)/2  COMPENSATION REQUIREMENT (CR) >> 0  CR = RCl X LF X IF  INSERT PHOTOS:	Right Bank								100%			
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The Clis and RCl should be rounded to 2 declinal places. This CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCl) >> 0.49  RCl = (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >> 0  CR = RCl X LF X IF		Score >	1.1	0.6						CI= (Sum % RA * So	cores*0.01)/2	
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  MOTE. The Cits and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >> 0.49  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >> 0  CR = RCI X LF X IF  INSERT PHOTOS:	Left Bank								100%			
MOTE: The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >> 0.49  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >> 0  CR = RCI X LF X IF  INSERT PHOTOS:		Score			NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH	Lt Ballk CI >	0.30	0.90
COMPENSATION REQUIREMENT (CR) >> 0  CR = RCI X LF X IF  INSERT PHOTOS:	NOTE: The CIs and F	RCI should be rounded								CONDITION IND	EX (RCI) >>	0.49
INSERT PHOTOS:										· · ·		0
											LITT (01.) >>	
			MPACT:									
		0020 11										
·												

NC DWQ Stream Identification Form Version 4.11 Long Branch 04-STR-14

Date:	Project/Site: DO	C2RVA - Area 04	Latitude:	
Evaluator:	County: Carolin	ne	Longitude:	
<b>Total Points:</b> 0 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name	:
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1 <sup>a</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	o = 0	Yes	= 3
a artificial ditches are not rated; see discussions in manual		·		
B. Hydrology (Subtotal =)		4		
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No.	0 = 0	Yes	= 3
C. Biology (Subtotal =)	1			1
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OBL	= 1.5 Other = 0	)
*perennial streams may also be identified using other methods Notes: Stream not accessible to field teams in this			eet	
Sketch:				

				perennial	or use in Virg	nels classified as	n wadeable chan	For use i			
	Impact Factor	Impact/SAR length	SAR#	Date	нис	Cowardin Class.	Locality		Project Name		Project #
				8/12/2016	02080105	R2	VA	04	C2RVA - Area	DC	N/A
				TD 45	04.67	tion	e and Informa	Stream Name		e(s) of Evaluat	
				IK-13	04-S7	dition (oracion, agr	and provailing cond	on of the stream a		gering, R. F	
	oro	Sev	or	Po		Conditional Categor	· ·	1		Opti	Chamiero
		A	<u>м</u>	4		-A	ptimal	J. J.	and a	N <sub>4</sub>	
	stability. Severe tained within the d below average			are near vertical. Er	stable than Severe	or Poor due to lo Erosion may be pre	ew areas of active cted banks. Majority table (60-80%). tion or natural rock	erosion or unproted of banks are st	or active erosion; 80-		Channel Condition
CI	egetative protection n 20% of banks, is on. Obvious bank Erosion/raw banks b/OR Aggrading nan 80% of stream by deposition, stability. Multiple d/or subterranean	rooting depth, mv vertical/undercut. Ve present on less than not preventing erosi sloughing present. I on 80-100%. AND channel. Greater th bed is covered contributing to ins thread channels an	of banks, and is int erosion. AND/OR eam is covered by Sediment is ent in nature, and ability. AND/OR V-shave vegetative int on > 40% of the idiment deposition is	present on 20-40% insufficient to prever 60-80% of the stre sediment. Stemporary/transie contributing to instat shaped channels protection is preser	treambanks may rout. AND/OR 40- overed by sediment.  emporary/transient,  ty. Deposition that  ability, may be  ND/OR V-shaped  stative protection on  s and depositional	60% of banks. S bevertical or unde 60% of stream is co Sediment may be t contribute instabilit contribute to st forming/present. A	-80%) AND/OR tures contribute to hkfull and low flow effined. Stream likely nkfull benches, or floodplains along reach. Transient 0-40% of the stream tom.	Depositional feat stability. The bar channels are well do has access to ba newly developed portions of the r	nches are present. iginal floodplain or de bankfull benches. and transverse bars ediment deposition	protection or nature (80-100%). AND bars/bankfull benn Access to their ori- fully developed wid- Mid-channel bars, a few. Transient sec covers less than	
2.0		1	.6	1.	2		.4	2	3	3	Score
		NOTES>>		length & width ma	measurements of	gory	areas along the en	Con		I BUFFERS: A	. RIPARIAN
			Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present,	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	anopy cover and a derstory. Wetlands		Riparian Buffers
			conditions.	comparable condition.	with <30% tree canopy cover with maintained understory.						
			Low	condition.  High	canopy cover with maintained understory.	High	Low 11	High	5	1	Condition
				High 0.6  Ensure the of % R	canopy cover with maintained understory.  Low  0.75	0.85	1.1 egories and Condith and width. Calc	1.2 into Condition Cate or estimating leng	each stream bank i	fian areas along eaure footage for eaure footage for eaure footage for eaure footage for eaure footage for eaure footage for eaure footage for eaure footage for eaure footage for eaure footage for eaure footage for eaure for eaure footage footage for eaure footage f	Scores  Delineate ripa Determine squ Enter the % R
	ores*0.01)/2	CI= (Sum % RA * Sc	Low 0.5 the sums Riparian equal 100 100%	High 0.6  Ensure the of % R	canopy cover with maintained understory.  Low  0.75	0.85	1.1 egories and Condith and width. Calc	1.2 into Condition Cate or estimating leng	each stream bank in ach by measuring	rian areas along ea uare footage for ea iparian Area and S	Scores  Delineate ripa Determine squ
CI	0.78	Rt Bank CI >	Low 0.5 the sums Riparian equal 100 100%	High 0.6  Ensure the of % R	canopy cover with maintained understory.  Low  0.75	0.85	1.1 egories and Condith and width. Calc	1.2 into Condition Cate or estimating leng arian category in the	each stream bank in ach by measuring Score for each rips 70% 0.6	rian areas along eauare footage for eauiparian Area and S % Riparian Area> Score >	Scores  Delineate ripa Determine squ Enter the % R
CI 0.99		Rt Bank CI >	Low 0.5 the sums riparian 100%	High 0.6  Ensure the of % R Blocks en	canopy cover with maintained understory.  Low 0.75  the descriptors. ed for you below.	0.85	1.1 egories and Cond th and width. Calc ne blocks below.	1.2 into Condition Cate or estimating leng arian category in th 30% 1.2	pach stream bank is ach by measuring Score for each rips 70% 0.6 100% 1.2	rian areas along ea uare footage for ea iparian Area and S % Riparian Area> Score >	Scores  Delineate ripa Determine squ Enter the % R Right Bank Left Bank INSTREAN
	0.78	Rt Bank CI >	Low 0.5 the sums Riparian equal 100 100% 100%	endition.  High  0.6  Ensure the of % R  Blocks et	canopy cover with maintained understory.  Low 0.75  the descriptors. ed for you below.	0.85	1.1 egories and Cond th and width. Calc ne blocks below. and depths; woody	1.2 into Condition Cate or estimating leng arian category in th 30% 1.2 es, water velocity a features.	pach stream bank in ach by measuring Score for each rips 70% 0.6 100% 1.2 Tried substrate size complexes, stable	rian areas along en uare footage for ea iparian Area and S % Riparian Area > Score >  % Riparian Area > Score >  1 HABITAT: Val.; SAV; riffle poole of	Scores  Delineate ripa Determine squ Enter the % R Right Bank  Left Bank INSTREAN anks; root mats;
	0.78	Rt Bank CI >	Low 0.5 the sums riqual 100 100% 100%  s shade; undercut	condition.  High  0.6  Ensure the of % R  Blocks end  ow embededness;	canopy cover with maintained understory.  Low 0.75  the descriptors. ed for you below.  stable substrate; I	0.85  ition Scores using culators are provided and leafy debris; al Category  Stable habitat eler	egories and Cond th and width. Calc ne blocks below.	1.2  into Condition Cate or estimating leng arian category in the 30% 1.2  es, water velocity a features.  Subo Stable habitat ele present in 30-50% adequate for r	ach stream bank is ach by measuring Score for each rips 70% 0.6 100% 1.2 arried substrate size complexes, stable simal	rian areas along en uare footage for ea iparian Area and S % Riparian Area > Score >  % Riparian Area > Score >  1 HABITAT: Val.; SAV; riffle poole of	Scores  Delineate ripa Determine squ Enter the % R Right Bank Left Bank INSTREAN

Stream Impact Assessment Form Page 2										
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	•
N/A	CSX		VA	R2	02080105	8/12/2016	04-STR-15	500	1	•
4. CHANNEL spoil piles, constr	. ALTERATION: Stream crossin ictions, livestock	gs, riprap, concret			ghtening of chann	nel, channelization	ı, embankments,	NOTES>>Th runs adjacer		
	Negligible	Mir	Conditiona nor		erate	Se	vere	railroad.		
Channel Alteration		Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% by any of the chan in the parameter 80% of banks sh	of reach is disrupted nel alterations listed guidelines AND/OR lored with gabion, r cement.			
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			0.90
	REACH (	CONDITION I	NDEX and S	TREAM CON	IDITION UNI	TS FOR THI	S REACH		,	
NOTE: The Cls and R	CI should be rounded to 2 decimal places. Th							CONDITION IN	IDEX (RCI) >>	0.96
								= (Sum of all C		5.55
									MENT (CR) >>	0
							CR = RCI	X LF X IF		
DESCRIBE P	ROPOSED IMPACT:									

Project/Site: DC2RVA - Area 04

NC DWQ Stream Identification Form Version 4.11

Date: 08/12/2016

04-STR-15

Latitude: 38.060634

Evaluator: L. Eggering, R. Porath	County: Carolin	е	Longitude: -77	7.375793
<b>Total Points:</b> 30.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determi Ephemeral Inte	nation (circle on rmitten Perenni	Other e.g. Quad Name:	
A 0	Alternat	NA/ 1	No depote	01
A. Geomorphology (Subtotal = 10.5)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
Active/relict floodplain	0	1	2	3
Depositional bars or benches	0		2	3
7. Recent alluvial deposits	0	$\overline{}$	2	3
8. Headcuts	0	$\overline{}$	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 10)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2)	3
14. Leaf litter	1.5	<u> </u>	0.5	0
15. Sediment on plants or debris	0	0.5		1.5
16. Organic debris lines or piles	0	0.5	1 _	(1.5)
17. Soil-based evidence of high water table?		0 = 0	Yes:	
C. Biology (Subtotal = 10)		· · ·		
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0		2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish		0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	(1)	1.5
26. Wetland plants in streambed			OBL = 1.5 Other = 0	
*perennial streams may also be identified using other met	hods. See p. 35 of manua	ıl.		
Notes: Field Sheet: 11-A-STR-04- LERP.				
Sketch:				

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
		5 · · · · · · · · · · ·			nels classified a	s intermittent or		212 "	Impact/SAR	Impact	
Project #		Project Name	9	Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R2SB	02080105	12/3/2015				
Nam	e(s) of Evaluate  K. Astroth	tor(s)	Stream Nam	e and Informa	ation	04.67	ΓR-16				
Channel C	Condition: Asse	ose the cross see	tion of the stream	and provailing o	andition (arasian		IK-10				
Chamiler				C	Conditional Catego		Po	0.5	Sev	loro.	
	Opti	IIIIai	Subo	ptimal	IVIAI	giriai	1	OI	Jev.	ere //	
	1	Who have		ew areas of active	Poor. Banks more	less than Severe or stable than Severe	Overwidene Vertically/laterally	unstable. Likely to	Deeply incised		
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran instability. Depositi stability, may be	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be issient, contribute on that contribute to forming/present.	widen further. Major are near vertical. E 60-80% of bank protection preset banks, and is insurerosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	rosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the de by sediment. corary/transient in jutting to instability. de channels have	vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious bank sl. Erosion/raw ban AND/OR Aggradin;	tained within the bid below average ajority of banks ut. Vegetative on less than 20% of eventing erosion. Sughing present. Its on 80-100%.	
	10% of			rs 10-40% of the bottom.	vegetative protecti banks and deposit	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the bard sediment depose	iks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1		2.4
NOTES>>								IIN-UJ.			
	N BUFFERS: A	Assess both bank	d's 100 foot riparia	an areas along the	e entire SAR. (ro			TR-03.			
			c's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt	h may be accep	NOTES>>	has	
	Opti Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subor ripariar Con Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% free	an areas along the	e entire SAR. (ro	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained		h may be accep		d along it. n area	
RIPARIAI	Opti  Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	NOTES>> Right bank access roa Left riperia	d along it. n area	
RIPARIAI Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30%</a> tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other cornerable conditions.	NOTES>> Right bank access roa Left riperia	d along it. n area	
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scoelow.	Opti Tree stratum (dbh > with > 60% tree cc non-maintained und located within the	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dength areas with a ptimal areas with a pti	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Right bank access roa Left riperia	d along it. n area	
Riparian Buffers  Condition Scores Delineate ripascriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  .5  each stream ban each by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 10%	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Coungt	Be entire SAR. (rogory  Mar  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prove.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Right bank access roa Left riperia	d along it. n area	
Riparian Buffers  Condition Scores Delineate ripascriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and	Be entire SAR. (rogory  Mar  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicator Scores us Calculators are provent	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, roite feed lots, trails, or other comparable conditions.	NOTES>> Right bank access roa Left riperia	d along it. n area ballast.	
Riparian Buffers  Condition Scores  Delineate rip: secriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree oc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream baneach by measurin Score for each ri 30% 1.1	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.85	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (an the blocks below  1.0  1.0  1.1  Categories and Congth and width. (an the blocks below  1.1  Categories and Congth and width. (an the blocks below  1.0  1.0  1.0  1.0  1.0  1.0  1.0  1.	Be entire SAR. (rogory  Mar  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prove.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, roite feed lots, trails, or other comparable conditions.	NOTES>> Right bank access roa Left riperia containsd	d along it. n area ballast.	CI
Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine scilow. Enter the % I	Tree stratum (dbh > with > 60% tree oc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each ri  30%  1.1  40%  1.2	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 10% 0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 30% 0.6	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the condition of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil laded surfaces, or corps, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Right bank access roa Left riperia containsd  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	d along it. n area ballast.	CI 0.78
Riparian Buffers  Condition Scores  Delineate rip. Secriptors. Determine sclow. Enter the % I	Tree stratum (dbh > with > 60% tree oc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 30% 1.1 40% 1.2  aried substrate si	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category it 10% 0.85	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 0.6  20% 0.5  by and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the condition of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil laded surfaces, comparable conditions.  Low Oost Description of the comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Right bank access roa Left riperia containsd	d along it. n area ballast.	
Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine scolow. Enter the % I Right Bank  Left Bank  INSTREAL	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 30% 1.1  40% 1.2  aried substrate si iffle poole comple	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 10% 0.85  40% 0.6  zes, water velocit exes, stable feature	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 0.6  20%  0.5  by and depths; wores.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <20% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	NOTES>> Right bank access roa Left riperia containsd  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	d along it. n area ballast.	
Riparian Buffers  Condition Scores Delineate rip sescriptors. Determine sc slow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree oc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream baneach by measurin 30% 1.1  40% 1.2  aried substrate si iffle poole completimal	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 10% 0.85  40% 0.6  Zes, water velocit exes, stable featur  Subo Stable habitat elei	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 0.6  20% 0.5  by and depths; wo res.  Conditional ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr w.  30%  0.5	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ed  Blocks ed  All Comparable conditions are active to the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%	NOTES>> Right bank access roa Left riperia containsd  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	d along it. n area ballast.	
Riparian Buffers  Condition Scores Delineate ripscriptors. Determine scolow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream	Tree stratum (dbh > with > 60% tree oc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin 30% 1.1 40% 1.2 aried substrate si iffle poole completimal	Con Subo Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.85  40% 0.6  zes, water velocit exes, stable featur Subo Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 30% 0.6  20% 0.5  by and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Andition Scores us Calculators are present, 30% 0.5  Stable habitat ele present in 10-30% are adequate for	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory. Low  0.75  sing the ovided for you  priss; stable substr	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, active feed lots, trails, active feed lots, trails, active feed lots, trails, active feed lots, trails, active feed lots, trails, active feed lots, trails, active feed lots, trails, active feed lots, trails, active feed lots, trails, active feed lots, trails, active feed lots, trails, active feed lots,	NOTES>> Right bank access roa Left riperia containsd  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	d along it. n area ballast.	

### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor R2SB 02080105 12/3/2015 04-STR-16 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> Conditional Category Moderate embankments, spoil piles, constrictions, livestock Channelization. Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is the parameter guidelines. If stream has been disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. CI 1.5 0.5 SCORE 1.3 1.1 0.9 0.7 0.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

# INSERT PHOTOS:



Top Left: View west from south of Page Road Top Right: Potential inundated culvert

Bottom Left: View of stream where it parallels the railroad

Bottom Right: View of stream from railroad

NC DWQ Stream Identification Form Version 4.11

Date: 12/3/2015	Project/Site: DC2RVA - Area 04	Latitude: 38.058585
Evaluator: K. Astroth	County: Caroline County	Longitude: -77.376140
<b>Total Points:</b> 30.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 14.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence				
Particle size of stream substrate	0		2	3
5. Active/relict floodplain	0		2	3
6. Depositional bars or benches	0		2	3
7. Recent alluvial deposits	0	<u> </u>	2	3
3. Headcuts	0	(1)	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual				
3. Hydrology (Subtotal = 6)				_
12. Presence of Baseflow	0	1	2	(3)
3. Iron oxidizing bacteria	0	(1)	2	3
4. Leaf litter	1.5		0.5	0
5. Sediment on plants or debris	0	0.5	1	1.5
6. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes :	= 3
C. Biology (Subtotal = 10			I	
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3)	2	1	0
20. Macrobenthos (note diversity and abundance)		1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1)	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed			OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method	ods. See p. 35 of manual			
Notes: Same field sheet as 04-STR-17. Field She				
And the second s	104			
Sketch:	access road			
	berm/hill			
1- 6			1	THE PERSON NAMED IN
and the second s	The state of the s	From some to continue seguin.	Complete and Charles on the American State of the State of	school at a state of the same
b	erm/hill	dile	The state of the s	
	small o	ике		
	ballast			-

		Stre	Unit	fied Stream N	Methodology f	or use in Virg		m 1)			
				wadeable chan	nels classified a	s intermittent or	perennial		Impact/SAR	Impact	
Project #		Project Name	•	Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A		2RVA - Area		VA	R2SB	02080105	12/3/2015				
Nam	e(s) of Evaluate  K. Astroth	tor(s)	Stream Nam	e and Informa	ation	04-S	FD 47				
Channal C		th	tion of the other care				IK-17				
. Chamilei C	Condition: Asse			C	Conditional Catego	ry	D-		0		
	Opti	mai	Subo	ptimal	Iviar	ginal	Po	or	Sev	ere	
		AND SHAPE		ew areas of active	Poor. Banks more	less than Severe or stable than Severe	Overwidene Vertically/laterally u	ınstable. Likely to	Deeply incised	(or excavated),	
Channel Condition	Very little incision of 100% stable bat surface protection prominent (80-1). Stable point bars/are present. Acce floodplain or fully bankfull benches, and transverse basediment depositio	n or natural rock, 00%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars, ars few. Transient	of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope portions of the r	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient	Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. See temporary/tran instability. Deposition stability, may be	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Major are near vertical. E 60-80% of bank protection preset banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	rosion present on is. Vegetative it on 20-40% of ficient to prevent 60-80% of the d by sediment. prary/transient in uting to instability. d channels have	vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sk Erosion/raw ban AND/OR Aggradin;	ntained within the bed below average najority of banks ut. Vegetative on less than 20% of eventing erosion. Sughing present. ks on 80-100%.	
	10% of l			rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the bard sediment depose	ks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	uting to instability. channels and/or	CI
Score	3	}	2	.4	;	2	1.	6	1	l	2.4
NOTES>>			Same of	data sheet	as 04-STR-	16. Field SI	heet 11-A-S	TR-03.			
	N BUFFERS: A	Assess both bank	d's 100 foot riparia	an areas along the	e entire SAR. (ro						
	N BUFFERS: A		c's 100 foot riparia		e entire SAR. (roo			h may be accep	NOTES>>	has	
	Opti Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, unopy cover and a derstory. Wetlands	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ugh measuremen	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	h may be accep	NOTES>> Right bank access roa Left riperia containsd	d along it. n area	
RIPARIAI Riparian Buffers	Opti	mal 3 inches) present, nopy cover and a derstory. Wellands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	e entire SAR. (ror  gory  Mar-  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Right bank access roa Left riperia containsd	d along it. n area	
Riparian Buffers  Condition Scores  Delineate rips	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a Jerstory. Wetlands riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1	e entire SAR. (ror gory  Mar.  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded, surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Right bank access roa Left riperia containsd	d along it. n area	
Riparian Buffers  Condition Scores  Delineate ripiscriptors. Determine scolow.	Tree stratum (dbh > with > 60% tree canon-maintained und located within the	mal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dength areas with a ptimal areas with a pti	e entire SAR. (ron gory  Mar  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Right bank access roa Left riperia containsd	d along it. n area	
Riparian Buffers  Condition Scores Delineate ripesscriptors. Determine scelow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dength areas with a ptimal areas with a pti	e entire SAR. (ron gory  Mar  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Right bank access roa Left riperia containsd	d along it. n area ballast.	
Riparian Buffers  Condition Scores  Delineate rip: secriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	mal  3 inches) present, nopy cover and a derstory. Wetlands or inparian areas.  5  beach stream ban ach by measurin  Score for each ri  30%  1.1	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.85	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (an the blocks below  30%  0.6	e entire SAR. (ror gory  Mary  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dh) > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prove.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  Le sums parian qual 100  100%	NOTES>> Right bank access roa Left riperia containsd	d along it. n area ballast.	CI
Riparian Buffers  Condition Scores  Delineate rip: secriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	mal  3 inches) present, nopy cover and a terstory. Wetlands e riparian areas.  5  ach stream ban ach by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 10%	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Coungt	e entire SAR. (ror gory  Mary  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dh) > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prove.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Right bank access roa Left riperia containsd	d along it. n area ballast.	CI 0.78
Riparian Buffers  Condition Scores  Delineate rip. Secriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	mal  3 inches) present, inopy cover and a derstory. Wetlands er iparian areas.  5  ach by measurin  Score for each ri  30%  1.1  40%  1.2  aried substrate si	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category it 10% 0.85	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 0.6  20% 0.5  by and depths; wo	e entire SAR. (ror gory  Mary  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dh) > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are prove.  30% 0.5	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%	NOTES>> Right bank access roa Left riperia containsd	d along it. n area ballast.	
Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine scolow. Enter the % I Right Bank  Left Bank  INSTREAL	Tree stratum (dbh > with > 60% tree canon-maintained une located within the located withi	mal  3 inches) present, nopy cover and a ferstory. Wetlands er riparian areas.  5  5  5  5  5  5  5  6  6  7  8  7  8  7  8  8  8  8  8  8  8  8	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 10% 0.85  40% 0.6  zes, water velocit exes, stable feature	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 0.6  20%  0.5  by and depths; wores.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided to the condition of the condition	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (6th >3 inches) present, with +30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Right bank access roa Left riperia containsd  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	d along it. n area ballast.	
Riparian Buffers  Condition Scores Delineate ripescriptors. Determine scelow. Enter the % I Right Bank  Left Bank Left Banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree co non-maintained und located within the located with	mal  3 inches) present, nopy cover and a dependent with the dependent of t	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 10% 0.85  40% 0.6  Zes, water velocit exes, stable featur  Subo Stable habitat elei	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 0.6  20% 0.5  by and depths; wo res.  Conditional ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided to the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ed  Blocks ed  All Comparable conditions are active to the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 0.5  Low 100%  100%	NOTES>> Right bank access roa Left riperia containsd  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	d along it. n area ballast.	
Condition Scores  Delineate ripescriptors Determine scelebre Lenter the % I Right Bank  Left Bank Left Bank INSTREAI	Tree stratum (dbh > with > 60% tree canon-maintained une located within the located withi	mal  3 inches) present, nopy cover and a ferstory. Wetlands er riparian areas.  5  5  5  5  5  6  6  7  8  7  8  8  8  7  8  8  8  8  8  8	Con Subo Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.85  40% 0.6  zes, water velocit exes, stable featur Subo Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 30% 0.6  20% 0.5  by and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are proved. 30% 0.5  Calculators are proved. Stable habitat elepresent in 10-30% are adequate for	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory. Low  0.75  sing the ovided for you  priss; stable substr	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%	NOTES>> Right bank access roa Left riperia containsd  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	d along it. n area ballast.	

### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor R2SB 02080105 12/3/2015 04-STR-17 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> Conditional Category Moderate embankments, spoil piles, constrictions, livestock Channelization. Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is the parameter guidelines. If stream has been disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. CI 1.5 0.5 SCORE 1.3 1.1 0.9 0.7 0.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

# INSERT PHOTOS:



Top Left: View west from south of Page Road Top Right: Potential inundated culvert

Bottom Left: View of stream where it parallels the railroad

Bottom Right: View of stream from railroad

NC DWQ Stream Identification Form Version 4.11

Date: 12/3/2015	Project/Site: DC2RVA - Area 04	Latitude: 38.058585
Evaluator: K. Astroth	County: Caroline County	Longitude: -77.376140
<b>Total Points:</b> 30.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 14.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence	-			
Particle size of stream substrate	0		2	3
5. Active/relict floodplain	0	4	2	3
6. Depositional bars or benches	0		2	3
7. Recent alluvial deposits	0	<u> </u>	2	3
3. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual	<u>.</u>			
3. Hydrology (Subtotal = <u>6</u> )				_
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes :	= 3
C. Biology (Subtotal = 10)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3)	2	1	0
20. Macrobenthos (note diversity and abundance)		1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	(1)	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed			OBL = 1.5 Other = 0	
*perennial streams may also be identified using other metho	ods. See p. 35 of manual		322 - 110 Othor - 0	
Notes: Same field sheet as 04-STR-16. Field She				
totos. Camo nota onost do o i o i it io. i lold o i	33. 11 / 1 3 11 00.			
And the second s				
Sketch:	access road			
	berm/hill			
1- 1- 0	7	<u> </u>	4-11-1-1	or promise
A principal and the property of the second s	The state of the s	Programme to confirm manual in	Control and the second of the	mendada in the street of the
b	erm/hill	111		- Company
	small	dike		-
	ballast			-

		Stre	Unit	fied Stream M	lethodology f	Form	ginia	m 1)			
Project #		Project Name		Locality	nels classified a Cowardin Class.	HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	04	VA	R2SB	02080105	12/3/2015		lengin	racioi	
	e(s) of Evalua			e and Informa	_			l			
	K. Astroth					04-S	ΓR-18				
I. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Optimal		Subo	ptimal	onditional Catego Mar	ginal	Po	or	Sev	ere	
	-		1		Often incised, but	less than Severe or	Overwiden	ed/incised.	1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or full) bankfull benches. and transverse ba	on or natural rock, 100%). AND/OR /bankfull benches ess to their original by developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope portions of the r	tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow Il defined. Stream o bankfull benches, d floodplains along reach. Transient	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe ower bank slopes. resent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be isient, contribute to torming/present.	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. orary/transient in buting to instability.	Deeply incised vertical/lateral in incision, flow corbanks. Streambe rooting depth, revertical/lunderc protection present obanks, is not pre Obvious bank sla Erosion/raw ban AND/OR Aggradin	stability. Severe tained within the de below average hajority of banks ut. Vegetative on less than 20% of venting erosion. Doughing present. ks on 80-100%.	
	10% of	on covers less than bottom.		rs 10-40% of the bottom.	vegetative protecti banks and deposit	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depor	nks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by outing to instability. channels and/or	С
Score	3	3	2	.4		2	1.	6	1		2.
A	4 BUFFERS.	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	th may be accep	table)		
z. IIII AIIIA		Assess both bank	Con	an areas along the ditional Cate ptimal	gory	ginal	ts of length & wid		notes>> Pasture ald	ong left	
Riparian Buffers	Opti Tree stratum (dbh: with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con	ditional Cate	gory	Ginal  Low Marginal:  Non-maintained, dense herbaceous vegetation,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor:	NOTES>>	portion of Ballast ank for a	
Riparian Buffers	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ir iparian areas lacking shrub and tree stratum, hor production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> Pasture ald bank for a the reach. near left ba	portion of Ballast ank for a	
Riparian	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious spoil lands, denuded surfaces, row crops, active feed oots, ratik, or other comparable conditions.	NOTES>> Pasture ald bank for a the reach. near left ba	portion of Ballast ank for a	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of t	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream bant each by measurin score for each ries.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100	NOTES>> Pasture ald bank for a the reach. near left ba	portion of Ballast ank for a	
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Riparian Buffers  Condition Scores  Delineate rip descriptors. Delescriptors. Enter the % l	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bani each by measurin Score for each ri 100% 1.2	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provential or proventi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ir iparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>> Pasture ald bank for a the reach. Inear left ba portion of the second sec	portion of Ballast ank for a the reach.	
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Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin  Score for each ri  100%  1.2  5%  1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in  5% 1.1  zes, water velocit	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 1.8  20% 0.85  by and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided to the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you  10%  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>> Pasture ald bank for a the reach. near left ba portion of t	portion of Ballast ank for a the reach.	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % Right Bank  Left Bank  Jundercut banks,	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin  Score for each ri  100%  1.2  5%  1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in  5% 1.1  zes, water velocit	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 1.8  20% 0.85  by and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Acalculators are provided to the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you  10%  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>> Pasture ald bank for a the reach. near left ba portion of the  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	portion of Ballast ank for a the reach.	
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Condition Scores  Delineate rip descriptors. Left Bank  Left Bank  Left Bank  INSTREAl undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree conon-maintained un located within th  1.  arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> core >  M HABITAT: Wood mats; SAV; r  Opti	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream bank each by measurin 100% 1.2  5% 1.2 aried substrate si iffle poole completimal are typically present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  5% 1.1  zes, water velocit exes, stable featur  Subo Stable habitat elpresent in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (In the blocks below 20% 0.85 by and depths; wores.  Conditiona	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Acalculators are proved the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the rovided for you  10%  0.75  bris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % Reserved Blocks estable Blocks	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed older conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Pasture ald bank for a the reach. near left ba portion of the  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	portion of Ballast ank for a the reach.	0.9
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cz non-maintained un- located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Vi root mats; SAV; r  Opti  Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream bank each by measurin 100% 1.2  5% 1.2 aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in  5% 1.1  zes, water velocit exes, stable featur  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below  20% 0.85  by and depths; wo res.  Conditiona ptimal ments are typically % of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the rovided for you  10%  0.75  bris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  he sums iparian qual 100  100%  100%  Iness; shade;	NOTES>> Pasture ald bank for a the reach. near left ba portion of the  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	portion of Ballast ank for a the reach.	

### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point Project # Date SAR length Impact Factor R2SB 02080105 12/3/2015 04-STR-18 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by an of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed i srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not cement. guidelines. guidelines. recovered. recovered. CI 0.5 SCORE 1.5 1.3 1.1 0.9 0.7 1.30 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: View of Mattaponi through forested floodplain

Top Right: Mattaponi

**Bottom Left: Potential inundated culvert** 

**Bottom Right: View north** 

NC DWQ Stream Identification Form Version 4.11

04-STR-18

1.5

1.5

1.5

Date: 12/3/2015	Project/Site: DC2RVA - Area 04	Latitude: 38.044827
Evaluator: K. Astroth	County: Caroline County	Longitude: -77.376882
<b>Total Points:</b> 33.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*	Ephemeral intermittent refermal ve.g. Quad Name.						
A. Geomorphology (Subtotal = 15)	Absent	Weak	Moderate	Strong			
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)			
2. Sinuosity of channel along thalweg	0	1	2	3			
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3			
Particle size of stream substrate	0	1	2	3			
5. Active/relict floodplain	0	$\Box$	2	3			
6. Depositional bars or benches	0	(1)	2	3			
7. Recent alluvial deposits	0	1	2	3			
8. Headcuts	0	1	2	3			
9. Grade control	0	0.5	1	1.5			
10. Natural valley	0	0.5		1.5			
11. Second or greater order channel	No	= 0	Yes = 3				
<sup>a</sup> artificial ditches are not rated; see discussions in manual							
B. Hydrology (Subtotal = 6 )							
12. Presence of Baseflow	0	1	2	(3)			
13. Iron oxidizing bacteria	0	1	2	3			
14. Leaf litter	1.5	1	0.5	0			
15. Sediment on plants or debris	0	0.5	1	1.5			
16. Organic debris lines or piles	0	0.5	1	1.5			
17. Soil-based evidence of high water table?	No	= 0	Yes = 3				
C. Biology (Subtotal = <u>12.5</u> )							
18. Fibrous roots in streambed	(3)	2	1	0			
19. Rooted upland plants in streambed	(3)	2	1	0			
20. Macrobenthos (note diversity and abundance)		1	2	3			
21. Aquatic Mollusks	0	(1)	2	3			
22. Fish	0	0.5	1	1.5			
		· · · · · · · · · · · · · · · · · · ·					

0

0

0

0.5

0.5

0.5

FACW = 0.75; OBL = 1.5 Other = 0

26. Wetland plants in streambed

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet 11-A-STR-02. Mattaponi River.

23. Crayfish

25. Algae

24. Amphibians

Sketch: pasture slope bench Tracks

		Stre	am A			for use in Virg	_	,			
					nels classified a	s intermittent or					
Project #	ı	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area		VA	R2SB	02080105	12/3/2015				
Name	e(s) of Evaluate  K. Astroth	tor(s)	Stream Nam	e and Informa	ation	04-5	ΓR-19				
I. Channel C	Condition: Asse	ess the cross-sec	ction of the stream	and prevailing c	ondition (erosion,		111110				
	Opti	mal	Subo	ptimal	Conditional Catego	ry ginal	Po	or	Sev	vere	
	· J	NAME OF THE PARKET	1	ر ا	Often incised, but	less than Severe or	Overwiden	ed/incised.	1	5	
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse be sediment depositio	nks. Vegetative in or natural rock, 00%). AND/OR bankfull benches is to their original of developed wide Mid-channel bars, ars few. Transient in covers less than	erosion or unproter of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to or newly develope portions of the r	ew areas of active ted banks. Majority table (60-80%). Ition or natural rock-80%) AND/OR ures contribute to ktfull and low flow III defined. Stream ob bankfull benches, d floodplains along each. Transient s 10-40% of the	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strear sediment. Se temporary/tran instability. Depositi stability, may be	stable than Severe wer bank slopes. essent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sisient, contribute on that contribute to forming/present. ed channels have	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of ffficient to prevent R 60-80% of the ad by sediment. corary/transient in puting to instability. ad channels have	vertical/lateral in incision, flow cor banks. Streambe rooting depth, revertical/underc protection present to banks, is not pre Obvious bank sle Erosion/raw bar AND/OR Aggradin	najority of banks cut. Vegetative on less than 20% of	
	10% of	bottom.	stream	bottom.	banks and deposit	ion on > 40% of the ional features which to stability.	40% of the bar sediment depos		deposition, contrib Multiple thread subterran	channels and/or	(
Score	3	3	2	.4		2	1.	6	1	1	2
NOTES>>				Fi	ield Sheet	11-A-STR-0	———— )1.				
2. RIPARIAN	N BUFFERS: A	Assess both bank	d's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh moncuromon					
	Opti	mal		ditional Cate	<del> </del>	ginal	ts of length & widt		NOTES>>		
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed oother comparable conditions.	FLOW	Wetland 1 wooded	
Buffers	Tree stratum (dbh > with > 60% tree co non-maintained und located within the	• 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	Marginal: Non-maintained, dense heriaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) green, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> FLOW	Wetland 1 wooded	
Condition Scores  1. Delineate ripz descriptors. 2. Determine sq	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located l	3 inches) present, anopy cover and a detestory. Wetlands e riparian areas.  5  each stream ban ach by measurin Score for each r	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Lategories and Coungth and width. (in the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicator of the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	pasture MON4		
Condition Scores  1. Delineate ripe descriptors. 2. Determine squelow. 3. Enter the % F	Tree stratum (dbh ) with > 60% tree canon-maintained und located within the located withi	- 3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban ach by measurin	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Lategories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicator of the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded dust, relis, or other comparable conditions.  Low  0.5  he sums iparian qual 100	pasture MON4	Wetland 1	
Condition Scores  1. Delineate ripe descriptors. 2. Determine squelow. 3. Enter the % F	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	5  sach stream ban ach by measurin Score for each r 50% 1.5	Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 40% 1.2	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Lategories and Coungth and width. (in the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicator of the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded dust, relis, or other comparable conditions.  Low  0.5  he sums iparian qual 100	FLOW culvert	/gabion	
Condition Scores  1. Delineate rips descriptors. 2. Determine squelow. 3. Enter the % F Right Bank  Left Bank	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	5  sach stream ban ach by measurin Score for each r 50% 1.5	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating lee inparian category in 40% 1.2	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. ( in the blocks below 10% 0.85	Mar  High Marginal: Non-maintained, den-maintained, segetation with either a shrub layer or a tree layer (b) press and inches (b) press and with a solution of the segetation	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	FLOW  Strain Str	/gabion	
Condition Scores  1. Delineate ripe descriptors. 2. Determine squelow. 3. Enter the % F Right Bank  Left Bank  3. INSTREAN	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	5  sach stream ban ach by measurin Score for each r 50% 1.5 90% 0.6 aried substrate si	Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 40% 1.2  10% 0.85  izes, water velocii	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 1.0% 0.85	Mar  High Marginal: Non-maintained, vegetation with either a shrub layer or a tree layer of a tree layer of a tree layer or a tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	FLOW culvert	/gabion	
Condition Scores  1. Delineate rips descriptors. 2. Determine squelow. 3. Enter the % F Right Bank  Left Bank  3. INSTREAR undercut banks; Instream	Tree stratum (dbh > with > 60% tree oz non-maintained und located within the located with	5  sach stream ban sach by measurin Score for each r 50% 1.5 90% 0.6 aried substrate siffle poole comple	Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le iparian category in 40%  1.2  10%  0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  categories and Co ngth and width. ( n the blocks below 1.0% 0.85	High Marginal: Non-maintained, Veneme intrained, vegetation with either a shrub layer or a tree layer (bhr > 31 invita (30% tree canopy cover.  High 0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100  100%	FLOW  Strain Str	/gabion	0.
Condition Scores  1. Delineate ripe descriptors. 2. Determine squelow. 3. Enter the % F Right Bank  Left Bank  3. INSTREAN undercut banks;	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	5  sach stream ban ach by measurin 50% 1.5 90% 0.6 aried substrate siffle poole comple	Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 40% 1.2  10% 0.85  izes, water velocit exes, stable featu  Subo  Stable habitat ele	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. (and the blocks below 10% 0.85	High Marginal: Non-maintained, Von-maintained,	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks end Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel olts, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	FLOW  Strain Str	/gabion	
Condition Scores  1. Delineate ripe descriptors. 2. Determine squelow. 3. Enter the % F Right Bank  Left Bank  3. INSTREAN undercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	5  sach stream ban sach by measurin Score for each r 50% 1.5 90% 0.6 aried substrate siffle poole comple	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating lee parian category in 40% 1.2  10% 0.85  Izes, water velocit exes, stable featu Subo  Stable habitat ele present in 30-50% are adequate fo	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Co ngth and width. ( n the blocks below 10% 0.85	High Marginal: Non-maintained, dense heritained, dense heritained, dense heritained, dense heritained, wegetation with either a shrub layer or a tree layer (dbh > 3 inches) for the canopy cover.  High  0.85  Indition Scores us Calculators are provided and leafy del al Category  Mar  Stable habitat ele present in 10-30 are adequate for an eadequate inal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely wegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%  100%	FLOW  Culvert  Cl= (Sum % RA*S  Rt Bank Cl>  Lt Bank Cl>  NOTES>>	/gabion		

### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor R2SB 02080105 12/3/2015 04-STR-19 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by any of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. is disrupted by any of the channel alterations listed in isrupted by any of the channel Iterations listed in Alteration guidelines. If stream has been guidelines. If stream has been shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. CI 1.5 SCORE 1.3 1.1 0.9 0.7 0.5 1.30 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

INSERT PHOTOS:



View of stream from ROW



NC DWQ Stream Identification Form Version 4.11

Date: 12/3/2015	Project/Site: DC2RVA - Area 04	Latitude: 38.036048
Evaluator: K. Astroth	County: Caroline County	Longitude: -77.376638
<b>Total Points:</b> 33 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 14.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0		(2)	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	o = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual	·			
B. Hydrology (Subtotal = $9$				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes :	= 3
C. Biology (Subtotal = $9.5$				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	$\bigcirc$	2	3
21. Aquatic Mollusks	(0)	Y	2	3
22. Fish	0	0.5	<b>(</b>	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method	ods. See p. 35 of manua	al.		
Notes: No access to this property. Field Sheet 11	1-STR-01-Ames.	147	.l	
***	Wood	ls/ We	tland 01 —	
			1  - -	
Sketch:	vvei	tland	E 3	
CICIOII.	_		78 -	
	1	1	(Z) SE	
			ballast	
n	asture	2	PI I	
P	ustuic	. 3	/   -	
		fence	Salaian II	
		. 0	Gabion — — Culvert 1	
		to	Cuivert 1	

		Stre			ment lethodology f		(For	m 1)			
					nels classified a						
Project #		Project Name	)	Locality	Cowardin Class.	нис	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	04	VA	R2SB	02080105	12/3/2015				
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
	K. Astroth					04-S	ΓR-20				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal	onditional Catego Mar	<sub>ry</sub> ginal	Poor		Sev	ere	
	1	W AND	1		Often incised, but	less than Severe or	Overwidene	ed/incised.	1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars are present. Acce floodplain or fully	00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are stylegetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to riewly develope	ew areas of active cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR ures contribute to klfull and low flow I defined. Stream o bankfull benches, d floodplains along	Poor. Banks more or Poor due to Ic Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Setemporary/tran instability. Depositi	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40 is covered by diment may be sient, contribute on that contribute to forming/present.	Vertically/laterally under further. Major	unstable. Likely to ority of both banks rosion present on ss. Vegetative and to 20-40% of fficient to prevent & 60-80% of the dby sediment. orary/transient in unuting to instability.	vertical/lateral ininicisor vertical/lateral ininincision, flow conbanks. Streambe rooting depth, myertical/underc protection present cobanks, is not pre Obvious bank slo Erosion/raw bank	stability. Severe tained within the d below average ajority of banks ut. Vegetative in less than 20% of venting erosion. bughing present. ks on 80-100%.	
	sediment deposition 10% of	on covers less than bottom.	sediment cover	reach. Transient is 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the band	on is present on > iks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1		2.0
NOTES>> 2. RIPARIAI	N BUFFERS: /	Assess both bank	d's 100 foot riparia		e entire SAR. (ro			h may be accep	otable)		
				ditional Cate					NOTES>>		
Riparian Buffers	Tree stratum (dbh:	imal  > 3 inches) present, anopy cover and a derstory. Wetlands er iparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	large trees	mostly saplings dense vegetation en	
			High	Low	High	Low	High	Low	culvert/ga	bion	
Condition Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
	arian areas along						Ensure the				
descriptors.  2. Determine so below.	quare footage for e	Score for each r	parian category in		V.		Blocks ed				
descriptors. 2. Determine so pelow.	Riparian Area and % Riparian Area>	Score for each r	parian category is	20%	v.		Blocks ed	qual 100 100%	-		
descriptors.  2. Determine so below.  3. Enter the % I	Riparian Area and	Score for each r	parian category in		v.		Blocks ed		CI= (Sum % RA * Si	cores*0.01)/2	
descriptors.  2. Determine sobelow.  3. Enter the % I	Riparian Area and % Riparian Area> Score >  % Riparian Area>	Score for each r 25% 1.1	parian category in 55% 0.85	20% 0.5 20%	v.		Blocks ed		Rt Bank Cl >	0.84	CI
descriptors. 2. Determine sobelow. 3. Enter the % I Right Bank Left Bank	Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >	Score for each r 25% 1.1 30% 1.1	parian category in 55% 0.85 50% 0.85	20% 0.5 20% 0.5				100%	,		CI 0.85
descriptors.  2. Determine scibelow.  3. Enter the % I Right Bank  Left Bank  3. INSTREAI	% Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: V:	Score for each r 25% 1.1 30% 1.1 aried substrate si	parian category in 55% 0.85 50% 0.85 zes, water velocit	20% 0.5 20% 0.5 y and depths; wo		pris; stable substr		100%	Rt Bank Cl >	0.84	
descriptors. 2. Determine schelow. 3. Enter the % I Right Bank Left Bank 3. INSTREAI	Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >	Score for each r 25% 1.1 30% 1.1 aried substrate si	parian category in 55% 0.85 50% 0.85 zes, water velocit	20% 0.5 20% 0.5 y and depths; wo	ody and leafy det	oris; stable substr		100%	Rt Bank CI >	0.84	
descriptors. 2. Determine schelow. 3. Enter the % I Right Bank  Left Bank 3. INSTREAI	Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: V: root mats; SAV: r	Score for each r 25% 1.1 30% 1.1 aried substrate si	parian category in 55% 0.85 0.85 0.85 cas, water velocities, stable feature.	20% 0.5 20% 0.5 y and depths; wo res. Conditiona	ody and leafy det	ginal	ate; low embeded	100% 100% ness; shade;	Rt Bank CI >	0.84	
descriptors. 2. Determine schelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/ Available	Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: V: root mats; SAV: r  Opti  Habitat elements a	Score for each r 25% 1.1 30% 1.1 aried substrate si iffle poole completional irre typically present	parian category in 55% 0.85 50% 0.85  zes, water velocit exes, stable featu Subo Stable habitat ele present in 30-50%	20% 0.5 20% 0.5 y and depths; wo res. Conditional ments are typically 6 of the reach and	ody and leafy det  I Category  Mar  Stable habitat ele present in 10-30%	ginal ments are typically % of the reach and	ate; low embeded  Po Habitat elements a lacking or are ur	100%  100%  100%  ness; shade;  or  listed above are stable. Habitat	Rt Bank CI > Lt Bank CI > NOTES>>	0.84	
descriptors. 2. Determine schelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: V: root mats; SAV; r  Opti  Habitat elements a in greater than 5	Score for each r 25% 1.1 30% 1.1 aried substrate si iffle poole completional irre typically present	parian category is 55% 0.85 0.85 cas, water velocitiexes, stable feature stable present in 30-50 are adequate for popul	20% 0.5 20% 0.5 ty and depths; wo res. Conditional primal ments are typically	ody and leafy det  I Category  Mar  Stable habitat ele present in 10-309 are adequate fo popul	ginal ments are typically	ate; low embeded	100%  100%  100%  or  listed above are stable. Habitat ly present in less the reach.	Rt Bank CI > Lt Bank CI > NOTES>>	0.84	

### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point Project # Date SAR length Impact Factor N/A CSX R2SB 02080105 12/3/2015 04-STR-20 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. CI SCORE 1.5 1.3 1.1 0.9 0.7 0.5 0.90

# REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

# INSERT PHOTOS:



Top Left: View upstream of culvert under railroad

**Bottom Right: View downstream** from railroad



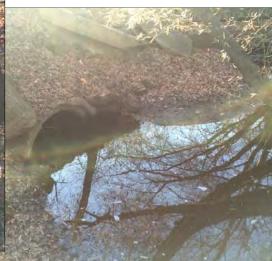
NC DWQ Stream Identification Form Version 4.11

Date: 12/3/2015	Project/Site: DC	C2RVA - Area 04	Latitude: 38.02	22874	
Evaluator: K. Astroth	County: Carolin	ne County	Longitude: -77	.374733	
<b>Total Points:</b> 31.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) ermittent Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal = 14.5	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3	
Sinuosity of channel along thalweg	0	(1)	2	3	
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1)	2	3	
4. Particle size of stream substrate	0	1)	2	3	
5. Active/relict floodplain	0		2	3	
6. Depositional bars or benches	0	(1)	2	3	
7. Recent alluvial deposits	0	1	(2)	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	No	0 = 0	Yes = 3		
a artificial ditches are not rated; see discussions in manual	· ·	1			
B. Hydrology (Subtotal = 7)				_	
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	No	0 = 0	Yes =	= 3	
C. Biology (Subtotal = 10 )					
18. Fibrous roots in streambed	3_	(2)	1	0	
19. Rooted upland plants in streambed	(3)	2	1	0	
20. Macrobenthos (note diversity and abundance)		1	2	3	
21. Aquatic Mollusks	(0)	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	0	0.5		1.5	
24. Amphibians	0	0.5		1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0		
*perennial streams may also be identified using other meth	hods. See p. 35 of manua	al.			
Notes: Field Sheet 11-A-STR-04.	/ _ <u></u>	TH	<u> </u>		
		\ [7			
	flow pri	marily 1			
Sketch:		1 11 1	I		
	from S	cuiver 7 2	1		
			1		

		Stre		SSESS fied Stream M	ment lethodology f		_	,			
Project #		Project Name		wadeable chan	Cowardin	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact	
N/A	,			VA	Class. R2SB	02080105	12/8/2015	OAK#	length	Factor	
	DC2RVA - Area 04 le(s) of Evaluator(s) Strea			e and Informa	_	02080105	12/0/2015				
	D. Mitchell, R. Mangum					04-S	ΓR-21				
. Channel C	Condition: Asse	ess the cross-sec	tion of the stream	n and prevailing co	ondition (erosion,	aggradation)					
	Optimal		Subo	Suboptimal Conditional		itional Category  Marginal Poor		Sev	vere		
	J.	**************************************	1		Often incised, but	less than Severe or	Overwiden		1	5	
Channel Condition	100% Stable banks. Vegetative		erosion or unproted of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to or newly develope portions of the r	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow ill defined. Stream o bankfull benches, defloodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vegei 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositio stability, may be	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is inst. erosion. AND/OI stream is cover Sediment is temp nature, and contril AND/OR V-shapp	ority of both banks crosion present on ks. Vegetative to 20-40% of fficient to prevent R 60-80% of the dby sediment. orary/transient in buting to instability. dc channels have	vertical/lateral in incision, flow cor banks. Streamber rooting depth, n vertical/underc protection present banks, is not pre Obvious banks lerosion/raw bar	(or excavated), stability. Severe tained within the ad below average najority of banks ut. Vegetative no less than 20% of eventing erosion. oughing present. liks on 80-100%.	
	sediment depositio 10% of I	bottom.	stream	rs 10-40% of the bottom.	vegetative protecti banks and depositi contribute	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depor	nks and stable sition is absent.	than 80% of stream deposition, contrib Multiple thread subterrar	n bed is covered by outing to instability. channels and/or lean flow.	
Score	3	3	2	2.4	:	2	1.	6		1	
. RIPARIAI	N BUFFERS: A	Assess both bank	's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	h may be accep	otable)		
2. RIPARIAI	N BUFFERS: A		Con	an areas along the ditional Cate ptimal	gory	ginal	Po		ntable)		
RIPARIAI Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca	imal  - 3 inches) present, anopy cover and a derstory. Wetlands	Con	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy of the	gory				NOTES>>		
Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca	imal  - 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>>		
Riparian	Opti  Tree stratum (dbh > with > 60% tree ca	imal 3 inches) present, anopy cover and a derstory. Wellands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>		
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine so	Opti Tree stratum (dbh > with > 60% tree ca	imal  - 3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorian Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition  ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>			
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine so	Tree stratum (dbh > with > 60% tree ca anon-maintained und located within the located wit	imal 3 inches) present, anopy cover and a deterstory. Wellands e riparian areas.  5  each stream band ach by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorian Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition  ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>			
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow.	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located within the located areas along a cauare footage for e	imal  3 inches) present, anopy cover and a deferstory. Wellands e riparian areas.  5  each stream banl ach by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorian Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition  ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>	cores*0.01)/2		
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow.	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands eriparian areas.  5  each stream bani ach by measurin  Score for each ri  100%  1.2  25%	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Categorian Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the condition  ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >	1.20		
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine scelow. Enter the % Right Bank	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	imal 3 inches) present, anopy cover and a terstory. Wellands e riparian areas.  5  each stream bani ach by measurin Score for each ri 100% 1.2 25% 1.2	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating leeparian category in 75% 1.1	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, traits, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >  Lt Bank CI >		
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % Right Bank  Left Bank	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	simal  3 inches) present, anopy cover and a derstory. Wetlands er liparian areas.  5  each stream bani ach by measurin 100% 1.2 25% 1.2 aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in  75% 1.1  zes, water velocii	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provinced to the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, traits, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >	1.20	
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow. Right Bank Left Bank B. INSTREAI	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within the located within the strategy of the located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands er liparian areas.  5  seach stream bank ach by measurin 100% 1.2 25% 1.2 aried substrate si iffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  75% 1.1  zes, water velocit exes, stable featu	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100 100%	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >  Lt Bank CI >	1.20	
Condition Scores  Delineate rip escriptors. Determine scelow. Enter the % Right Bank  Left Bank  Left Bank  Instream Habitat/ Available	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands er liparian areas.  5  5  5  6  6  7  8  8  8  8  8  8  8  8  8  8  8  8	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  75% 1.1  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Counth the blocks below t	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically % of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % Reserved Blocks estable Blocks	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or lots romparable conditions.  Low 0.5  Low 100%  100%  100%  100%	CI= (Sum % RA * S Rt Bank CI > Lt Bank CI >	1.20	
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine so elow. Enter the % Right Bank  Left Bank  Instream Habitat/	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	imal  3 inches) present, anopy cover and a destratory. Wetlands eriparian areas.  5  each stream bani ach by measurin 100% 1.2 25% 1.2 aried substrate si iffle poole completimal re typically present 0% of the reach.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in  75% 1.1  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ingth and width. (in the blocks below  ty and depths; wo res.  Conditiona ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%  100%  101%	CI= (Sum % RA * S Rt Bank CI > Lt Bank CI >	1.20	1

### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Impact Factor Project # Date R2SB 02080105 12/8/2015 04-STR-21 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> Conditional Category Moderate embankments, spoil piles, constrictions, livestock Culvert Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach is disrupted by any of the channel alterations listed in stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. CI SCORE 1.5 0.5 1.3 1.1 0.9 0.7 1.30 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF INSERT PHOTOS:

# INSERT PHOTOS:



Top Left: Representative view of stream Bottom Right: View of 4 foot concrete Culvert 01

NC DWQ Stream Identification Form Version 4.11

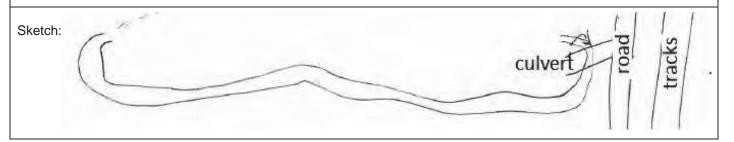
04-STR-21

Date: 12/8/2015	Project/Site: DC2RVA - Area 04	Latitude: 38.016444
Evaluator: D. Mitchell, R. Mangum	County: Caroline County	Longitude: -77.373794
<b>Total Points:</b> 34.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

≥ 19 or perennarii ≥ 30								
A. Geomorphology (Subtotal = 16	Absent	Weak	Moderate	Strong				
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3				
2. Sinuosity of channel along thalweg	0	1	(2)	3				
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3				
4. Particle size of stream substrate	0	1)	2	3				
5. Active/relict floodplain	0	1	2	3				
6. Depositional bars or benches	0	1	(2)	3				
7. Recent alluvial deposits	0	1	2	3				
8. Headcuts	9	1	2	3				
9. Grade control	0	0.5	1	1.5				
10. Natural valley	0	0.5		1.5				
11. Second or greater order channel	N	0 = 0	Yes:	= 3				
a artificial ditches are not rated; see discussions in manual								
B. Hydrology (Subtotal = 7								
12. Presence of Baseflow	0	1	2	3				
13. Iron oxidizing bacteria	0	1	2	3				
14. Leaf litter	1.5		0.5	0				
15. Sediment on plants or debris	0	0.5	1	1.5				
16. Organic debris lines or piles	0	0.5	1	1.5				
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	= 3				
C. Biology (Subtotal = <u>11.25</u> )								
18. Fibrous roots in streambed	3	(2)	1	0				
19. Rooted upland plants in streambed	(3)	2	1	0				
20. Macrobenthos (note diversity and abundance)	8	1	2	3				
21. Aquatic Mollusks	0	1	2	3				
22. Fish	0	0.5	1	1.5				
23. Crayfish	0	0.5	(1)	1.5				
24. Amphibians	0	0.5	1	1.5				
25. Algae	0	0.5	1	1.5				
26. Wetland plants in streambed		EACW = 0.75	OBL = 1.5 Other = 0	)				
				-				

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Includes culvert under access road/railroad. Field Sheet 12-BSTRM1a culvert1.



### **Stream Assessment Form (Form 1)** Unified Stream Methodology for use in Virginia For use in wadeable channels classified as intermittent or perennial Impact/SAR Cowardin Impact Project # **Project Name** SAR# Locality HUC Class length Factor DC2RVA - Area 04 ۷A R2SB 02080105 12/9/2015 Stream Name and Information Name(s) of Evaluator(s) D. Mitchell, R. Mangum 04-STR-22 (Mattaponi River) 1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation) Conditional Category Poor Suboptimal Severe Optimal Often incised, but less than Severe or Overwidened/incised Slightly incised, few areas of active Poor, Banks more stable than Severe Vertically/laterally unstable. Likely to Deeply incised (or excavated) or Poor due to lower bank slopes. Erosion may be present on 40-60% o widen further. Majority of both bank are near vertical. Erosion present of n or unprotected banks. Majorit vertical/lateral instability. Severe ery little incision or active erosion; 8 incision, flow contained within the banks. Streambed below average Channel of banks are stable (60-80%) 100% stable banks. Vegetative Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to both banks. Vegetative protection on 60-80% of banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Condition 40-60% of banks. Streambanks may protection present on 20-40% of rooting depth, majority of banks bevertical or undercut. AND/OR 40-60% of stream is covered by banks, and is insufficient to prever erosion. AND/OR 60-80% of the vertical/undercut. Vegetative otection present on less than 20% of banks, is not preventing erosion. Stable point bars/bankfull benches stability. The bankfull and low flow are present. Access to their original channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along sediment. Sediment may be stream is covered by sediment floodplain or fully developed wide bankfull benches. Mid-channel bars temporary/transient, contribute tability. Deposition that contribute Sediment is temporary/transient in Obvious bank sloughing present. nature, and contributing to instability AND/OR V-shaped channels have Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by and transverse bars few. Transient portions of the reach. Transient sediment covers 10-40% of the stream bottom. stability, may be forming/present. AND/OR V-shaped channels have sediment deposition covers less than regetative protection is present on 10% of bottom vegetative protection on > 40% of the panks and depositional features which 40% of the banks and stable deposition, contributing to instability. Multiple thread channels and/or subterranean flow. CI sediment deposition is absent. contribute to stability. Score 3 2.4 1.6 1 2.4 NOTES>> Field Sheet 12-BSTRM1b (Mattaponi River). 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Optimal Suboptimal Marginal Poor Low Marginal: Non-maintained, lense herbaceou High Poor: w Suboptimal: High Suboptima Riparian areas awns, mowed Low Poor: High Marginal: Riparian areas and maintained with tree stratum Non-maintained vegetation, riparian areas Impervious surfaces, mine with tree stratum areas nurseries (dbh > 3 inches) present, with > ense herhaceoi (dbh > 3 inches) present, with 30% no-till cropland; vegetation with acking shrub and ree stratum (dbh > 3 inches) preser actively grazed Riparian 30% tree canopy either a shrub tree stratum, hav denuded with > 60% tree canopy cover and a to 60% tree open water. If present, tree pasture, sparsel cover and a laver or a tree surfaces row canopy cover and containing both vegetated non-naintained area Buffers story. Wetlands maintained understory. ops, active fee lots, trails, or layer (dbh > 3 located within the riparian areas inches) present herbaceous and recently seeded Recent cutover with <30% tree stratum (dbh >3 ther comparable shrub lavers or a and stabilized, or inches) present with <30% tree (dense canopy cover. conditions non-maintained understory. other comparable condition. vegetation). canopy cover wit maintained understory High Low High Low High Low Condition 1.5 1.2 Scores . Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums . Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian . Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% % Riparian Area> Right Bank 1.5 Cl= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > 1.50 CI Left Bank 1.50 Score > 1.5 Lt Bank CI > 1.50 3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; NOTES>> indercut banks; root mats; SAV; riffle poole complexes, stable features Conditional Category Instream Optimal Suboptimal Marginal Habitat/ Stable habitat elements are typically Stable habitat elements are typically Habitat elements listed above are Available labitat elements are typically preser present in 30-50% of the reach and present in 10-30% of the reach and lacking or are unstable. Habitat Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of ents are typically present in les than 10% of the reach. CI populations populations. 1.5 0.5 1.50 Score 1.2 0.9

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX	VA	R2SB	02080105	12/9/2015	04-STR-22			
CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, mbankments, spoil piles, constrictions, livestock  Conditional Category  NOTES>>  Bridge construction.									
	Negligible Mi		nor	or Moderate		Severe			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5	1	

# REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

# INSERT PHOTOS:



View of Mattaponi River and bridge carrying tracks

NC DWQ Stream Identification Form Version 4.11 Mattaponi River 04-STR-22

Date: 12/9/2015	Project/Site: DC2RVA - Area 04	Latitude: 37.976986					
Evaluator: D. Mitchell, R. Mangum	County: Caroline County	Longitude: -77.363422					
<b>Total Points:</b> $48.75$ Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:					

A. Geomorphology (Subtotal = 23)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
Sinuosity of channel along thalweg	0	1	2	(3)
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1_	2	(3)
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	1	2	(3)
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 9				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	1)_	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 16.75				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	(3)
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	(1.5)
23. Crayfish	0	0.5	1	(15)
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		$\triangle ACW = 0.75$	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other method	ds. See p. 35 of manua	al.		
Notes: Field Sheet 12-B-STRM1b Mattaponi Rive	r.			
Sketch:	Q.			
1-	Mat	taponi River		
	Mat		The works	
	0			
- I	2			
	22			
	1			

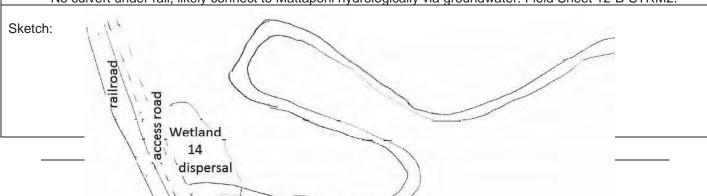
		Stre	Unif	ied Stream N	lethodology f	or use in Virg		m 1)			
		5 N			nels classified a	s intermittent or		212 "	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A	DC2RVA - Area 04 VA e(s) of Evaluator(s) Stream Name and Informa		R2	02080105	12/10/2015						
	e(s) of Evaluation	` '	Stream Name	e and informa	ation	04-S	ΓD_22				
	Condition: Asse		tion of the atroom	and provoiling o	andition (arasian		1123				
. Chamile C				C	Conditional Catego	ry					
	Opti	mai	Subo	ptimal	Iviar	ginal	Po	or	Sev	ere	
		المريد المولان	Slightly incised, fe	ew areas of active	Poor. Banks more	less than Severe or stable than Severe	Overwidene Vertically/laterally u	unstable. Likely to	Deeply incised	(or excavated).	
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	/ery little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient		Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Set temporary/tran instability. Deposition	ower bank slopes. esent on 40-60% of tative protection on Streambanks may brout. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Majc are near vertical. E 60-80% of banh protection preser banks, and is insul erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	rosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, rr vertical/underc protection present obanks, is not pre Obvious bank sle Erosion/raw bar AND/OR Aggradin	stability. Severe tained within the d below average ajority of banks ut. Vegetative in less than 20% of venting erosion. bughing present. ks on 80-100%.		
	sediment depositio 10% of		sediment cover	s 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have on on > 40% of the ional features which to stability.	vegetative protectic 40% of the ban sediment depos	ks and stable	than 80% of stream deposition, contrib Multiple thread subterran	bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1		3.0
NOTES>>				Fi	ield Sheet 1	12-B-STRM	2.				
. RIPARIAN	N BUFFERS: A	Assess both bank	d's 100 foot riparia	n areas along the	e entire SAR. (roi	ugh measuremen	ts of length & widt	th may be accep	table)		
				ditional Cate			•		NOTES>>		
	Opti	mal	Subo	otimal	Marginal Low Marginal:		Poor				
Riparian Buffers	Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.		containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Condition		_	High	Low	High	Low	High	Low			
Scores	1.	5	1.2	1.1	0.85	0.75	0.6	0.5			
escriptors.  Determine squelow.	arian areas along o uare footage for e Riparian Area and	ach by measurin	g or estimating le	ngth and width. (	Calculators are pr		Ensure the of % Ri	iparian			
Right Bank	% Riparian Area>	100%						100%			
	Score >	1.5							Cl= (Sum % RA * S	cores*0.01)/2	
Left Bank	% Riparian Area>	100%						100%	Rt Bank CI >	1.50	CI
	Score >	1.5							Lt Bank CI >	1.50	1.50
	// HABITAT: Va root mats; SAV; ri				ody and leafy deb	oris; stable substr	ate; low embeded	ness; shade;	NOTES>>		
ndercut banks:	,			Conditiona					1		
Instream	Optimal Suboptimal				Mar	ginal	Po	or	I		
Instream Habitat/	Opti	mal		ments are typically		ments are typically	Habitat elements				
Instream	_	re typically present	Stable habitat eler present in 30-50%	ments are typically 6 of the reach and r maintenance of	Stable habitat ele present in 10-30% are adequate fo			listed above are estable. Habitat ally present in less			CI

	St	ream In	npact A	ssessm	ent For	m Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	csx		VA	R2	02080105	12/10/2015	04-STR-23			
4. CHANNEL	_ ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of ch	nannel, channeliz	ation,	NOTES>>		
embankments, s	poil piles, constrictions, livestock		Conditiona					Bridge cor	struction.	
	Negligible	Mir	nor		erate	Sev	ere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with gai cem	of the channel in the parameter PR 80% of banks bion, riprap, or			CI
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5			1.50
	REACH CO	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			
NOTE: The CIs and R	CI should be rounded to 2 decimal places. T	he CR should be roun	nded to a whole number	er.				CONDITION IN		
								I= (Sum of all C		•
						'		ION REQUIRE	vi⊑NI (CK)>>	0
INSERT PHO	TO0:						ON = NO	AKLIKII		Ì
DESCRIBE F	PROPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11

Date: 12/10/2015	Project/Site: DC2RVA - Area 04	Latitude: 38.976958
Evaluator: D. Mitchell, R. Mangum	County: Caroline County	Longitude: -77.363525
<b>Total Points:</b> 43.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 21)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	2	(3)
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	(2)	3
ripple-pool sequence				
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0		2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No	0 = 0	Yes	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 9)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 13.75	_			
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1_	0
20. Macrobenthos (note diversity and abundance)	9	1	<b>(2)</b>	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	15
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed			OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other meth	ods. See p. 35 of manua			
Notes: Flows to low area at edge of slope along			erses into wetland,	saturates so
No culvert under rail, likely connect to Ma				



	Ephe	mera			SSESS Methodology f			(For	m 1a)		
					e in ephemeral s						
Project #		Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		C2RVA - Area		VA	R6	02080105	12/10/2015				
	e(s) of Evalua tchell, R. Ma		Stream Nam	e and Inform	ation	04-5	TR-24				
	,					07 0					
2. RIPARIAN	N BUFFERS:	Assess both bank				ugh measuremen	its of length & wid	th may be accept			
	Opt	Conditional Category ptimal Suboptimal Marginal				Po	oor	NOTES>> Field Shee	t 12-B-		
Riparian Buffers	Tree stratum (dbh with > 60% tree ca non-maintained un	> 3 inches) present, anopy cover and an derstory. Wetlands aas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces row crops, active feed lots, trail, or other comparable conditions.	STRM3	(12-0-	
Condition	1	.5	High 1.2	Low 1.1	High 0.85	0.75	High 0.6	0.5	-		
Scores  1. Delineate rips	arian areas along								1		
descriptors.	quare footage for e					•		the sums Riparian			
3. Enter the % F	Riparian Area and			n the blocks belo	w.		Blocks 6	equal 100			
Right Bank	% Riparian Area> Score >	80% 1.5	20% 0.5					100%	<u> </u>		
	% Riparian Ares	1000/						100%	CI= (Sum % RA * S Rt Bank CI >		
Left Bank	% Riparian Area>	100% 1.5						100%	Lt Bank CI >	1.30	1
		REACH C	ONDITION I	NDEX and S	TREAM CO	NDITION UN	IITS FOR TH	IS REACH			
NOTE: The CIs and F	RCI should be rounded	to 2 decimal places.	The CR should be rour	nded to a whole numb	er.				CONDITION IND		0
									CI= (Riparian CI)		
								CR = RC	I X LF X IF		
DESCRIBE F	PROPOSED II	MPACT:									

NC DWQ Stream Identification Form Version 4.11

Date: 12/10/2015	Project/Site: DC2RVA - Area 04	Latitude: 37.97435
Evaluator: D. Mitchell, R. Mangum	County: Caroline County	Longitude: -77.363336
<b>Total Points:</b> 9.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 4)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	<u>(1)</u>	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	(0)	1	2	3
5. Active/relict floodplain	8	(1)	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	( No	o = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $\frac{1}{1}$ )	_			
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
C. Biology (Subtotal = $4.75$ )				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	(i)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		EACW = 0.75	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other methods. S	ee p. 35 of manua	al.		
Notes: Field Sheet 12-B-STRM3.				
Sketch: ponding culvert ponding ponding		c m bed water		

Condition  Condition  Surface programment Stable poin are present floodplain bankfull beneated transvent sediment de Score  NOTES>>  Riparian Buffers  Tree stratum with > 60% non-maintain	. Mangum  Assess the cross-se  Optimal  Discission or active erosion; 80 lible banks. Vegetative otection or natural rock, it (80-10%). AND/OR it bars/bankfull benches. L Access heir original or fully developed wide niches. Mid-channel bars, erse bars few. Transient aposition covers less than 0% of bottom.	ection of the stream  Subo  Slightly incised, frem of banks are stream  Subo  Slightly incised, frem of banks are stream  Subo  Open of banks are stream of banks are stream  Subo  Slightly incised, frem of banks are stream  Subo  Open of banks are stream  Subo  Open of banks are stream  Subo  Subo  Open of banks are stream  Subo  Open of banks are stream  Subo  Subo  Open of banks are stream  Subo  Subo  Open of banks are stream  Subo  Subo  Open of banks are stream  Subo  Subo  Open of banks are stream  Subo  Subo  Open of banks are stream  Subo  Subo  Open of banks are stream  Subo  Subo  Open of banks are stream  Subo  Subo  Open of banks are stream  Open of banks are stream  Subo  Open of banks are stream  Open of banks are	Locality  VA  le and Information and prevailing of the prevailing	Cowardin Class.  R4SB  ation  Condition (erosion, Conditional Catego Mar  Often incised, but Poor, Banks more or Poor due to lo Erosion may be protot banks. Vege 40-60% of banks. bevertical or unde 60% of strear sediment. Se temporaryltran instability. Depositi stability, may be AND/OR V-shap vegetative protect banks and deposit contribute		Por  Por  Overwidene Vertically/laterally u widen further. Majc are near vertical. 60-80% of bank protection presen banks, and is inside erosion. AND/OR stream is covere Sediment is temp nature, and contrib AND/OR V-shape vegetative protectic 40% of the ban sediment depos	sd/incised.  Instable. Likely to rity of both banks rosion present on s. Vegetative t on 20-40% of fficient to prevent 6 60-80% of the d by sediment. orary/transient in uiting to instability, d channels have on is present on s ks and stable tition is absent.	Deeply incised vertical/lateral ins incision, flow con banks. Streambe rooting depth, m vertical/undercion present o banks, is not pre Obvious bank sic Erosion/raw ban AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread c subterran	(or excavated), stability. Severe tatained within the ad below average najority of banks ut. Vegetative on less than 20% of eventing erosion. oughing present. iks on 80-100%. If channels and/or lean flow.	CI 2.4
N/A  Name(s) of Ev D. Mitchell, R.  Channel Condition:  Channel Condition:  Very little inc 100% sta surface prominen Stable poir are present floodplain bankfull ber and transw sediment de 1  Score  NOTES>>  Riparian Buffers  Tree stratum with > 60% non-mantair	DC2RVA - Area raluator(s)  . Mangum  : Assess the cross-se  Optimal  dision or active erosion; 8(s) ble banks. Vegetative otection or natural rock, tt (80-10%). AND/OR tt bars/bankfull benches. L Access to their original or fully developed wide nches. Mid-channel bars, erse bars few. Transient sposition covers less than 0% of bottom.	Slightly incised, for erosion or unprotect of banks are sist vegetative protect prominent (60.5 begositional feat stability. The bar channels are well stability are sediment cover stream	va nand prevailing continue and prevailing continue and prevailing continue and prevailing continue and prevailing continue and prevailing an	Often incised, but Poor. Banks more or Poor due to k Erosion may be prought banks. Vege 40-60% of strear instability. Depositis stability, may be AND/OR V-shap vegetative protect banks and deposit contribute	o2080105  O4-S7 aggradation) ry ginal less than Severe or stable than Severe stable than Severe swer bank slopes. esente on 40-60% of other of the stable of the severe death of the sever	Poor Overwidene Vertically/laterally u widen further. Majo are near vertical bank protection presen banks, and is insuf erosion. AND/OR stedam is covern stedam is covern to the control of the bank o	or sidincised.  Instable, Likely to brity of both banks rossion present or so. Vegetative it on 20-40% of the dby sediment, oranyltransient in oranyltransient in stability, d channels have on is present on > ks and stable ition is absent.	Deeply incised of vertical/lateral ininincision, flow con banks. Streamber oroting depth, more translational translation of the protection present or banks, is not present or banks, is not pre Obvious bank slc Erosion/raw bank AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	(or excavated), stability. Severe tained within the ad below average najority of banks tut. Vegetative on less than 20% of eventing erosion, oughing present. Iks on 80-100%. g channel. Greater n bed is covered by utuing to instability, channels and/or lean flow.	
Channel Condition:  Channel Condition:  Channel Condition:  Channel Condition:  Very little inc. 100% sta surface program floodplain bankfull ber and transv sediment de 1  Score  NOTES>>  RIPARIAN BUFFEF  Riparian Buffers  Tree stratum with > 60% non-mantair	caluator(s)  . Mangum  : Assess the cross-se  Optimal  dision or active erosion; 80 tible banks. Vegetative otection or natural rock, tr (80-100%). AND/OR nt bars/bankfull benches to Access to their original or fully developed wide nothes. Mid-channel bars, erse bars few. Transient sposition covers less than 0% of bottom.	Slightly incised, feet or banks are st Vegetative protect or banks are st vegetative protect prominent (60 Depositional feat stability. The bar channels are well killey has access te in medical control of the portions of the resediment cover stream	rewareas of active cted banks. Majoritable (60-80%). Itable (60-80%). Itable (60-80%). AND/OR tures contribute to nakfull and low flow lidefined. Stream to bankfull benches, ed floodplains along reach. Transient rs 10-40% of the bottom.	Often incised, but Poor. Banks more or Poor due to le Erosion may be probet banks. Vege 40-60% of stream instability. Depositi stability. Depositi stability. may be aND/OR V-shap vegetative protect banks and deposit contribute	aggradation) ry ginal  less than Severe or stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR AND is covered by diment may be sisent, contribute on that contribute to on that contribute of channels have ion on > 40% of the ional features which to stability.	Overwidene Vertically/laterally u widen further. Majc are near vertical. E 60-80% of bank protection presen banks, and is insuf erosion. AND/OR stream is covere Sediment is temp nature, and contrib AND/OR V-shape vegetative protectic 40% of the ban sediment depos	sd/incised.  Instable. Likely to rity of both banks rosion present on s. Vegetative t on 20-40% of fficient to prevent 6 60-80% of the d by sediment. orary/transient in uiting to instability, d channels have on is present on s ks and stable tition is absent.	Deeply incised vertical/lateral inicision, flow con banks. Streambe rooting depth, m vertical/underc protection present o banks, is not pre Obvious bank slc Erosion/raw ban AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	(or excavated), stability. Severe tatained within the ad below average najority of banks ut. Vegetative on less than 20% of eventing erosion. oughing present. iks on 80-100%. If channels and/or lean flow.	
Channel Condition:  Channel Condition:  Channel Condition:  Very little inc. 100% sta vurface prominen Stable poin after prospherical proposed and transvisediment de 1  Score  NOTES>>  RIPARIAN BUFFEF  Riparian Buffers  Tree stratum with 5 60% non-maintair	. Mangum  Assess the cross-se  Optimal  Discission or active erosion; 80 lible banks. Vegetative otection or natural rock, it (80-10%). AND/OR it bars/bankfull benches. L Access heir original or fully developed wide niches. Mid-channel bars, erse bars few. Transient aposition covers less than 0% of bottom.	Slightly incised, frem of banks are sit stability. The bar stability. The bar stability. The bar stability. The bar stability. The bar stability. The sar stability is sar stability. The sar stability is sar stability. The sar stability is sar stability. The sar stability is sar stability. The sar stability is sar stability. The sar stability is sar stability. The sar stability is sar stability. The sar stability is sar stability. The sar stability is sar stability. The sar stability is sar stability. The sar stability is sar stability. The sar stability is sar stability. The sar stability is sar stability. The sar stability is sar stability. The sar stability is sar stability. The sar stability is sar stability. The sar stabi	rew areas of active cted banks. Majority table (60-80%). tition or natural rock -80%) AND/OR tures contribute to haffull and low flow ill defined. Stream to bankfull benches, ad floodplains along reach. Transient rs 10-40% of the bottom.	Often incised, but Poor. Banks more or Poor due to le Erosion may be protent banks. Vege 40-60% of banks. bevertical or unde 60% of strear sediment. Se temporaryltran instability. Depositi stability, may be AND/OR V-shap vegetative protect banks and deposit contribute	aggradation) ry ginal less than Severe or stable than Severe over bank slopes. esent on 40-60% of tative protection on Streambanks may recut. AND/OR 40- n is covered by diment may be sisent, contribute on that contribute on that contribute on that contribute on to forming/present. ed channels have ion on > 40% of the ional features which to stability.	Overwidene Vertically/laterally u widen further: Majc are near vertical: 60-80% of bank protection presen banks, and is insuf erosion. AND/OR stream is covere Sediment is temp nature, and contrib AND/OR V-shape vegetative protectic 40% of the ban sediment depos	sd/incised.  Instable. Likely to rity of both banks rosion present on s. Vegetative t on 20-40% of fficient to prevent 6 60-80% of the d by sediment. orary/transient in uiting to instability, d channels have on is present on s ks and stable tition is absent.	Deeply incised vertical/lateral inicision, flow con banks. Streambe rooting depth, m vertical/underc protection present o banks, is not pre Obvious bank slc Erosion/raw ban AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	(or excavated), stability. Severe tatained within the ad below average najority of banks ut. Vegetative on less than 20% of eventing erosion. oughing present. iks on 80-100%. If channels and/or lean flow.	
Channel Condition:  Channel Condition:  Channel Condition  Very little inc 100% sta surface prominen Stable poir are present floodplain bankfull ber and transv sediment de 1  Score  NOTES>>  RIPARIAN BUFFER  Riparian Buffers  Tree stratum with 5 60% non-maintair	Optimal  Dission or active erosion; 80 tible banks. Vegetative of the banks. Vegetative of the banks. Vegetative of the banks. Vegetative of the banks. Vegetative of the banks. Vegetative of the banks. Vegetative of the banks. Vegetative of the banks. Vegetative of the banks of	Slightly incised, figure of banks are sit vegetative protect prominent (60.0 bepositional feat stability. The bar channels are well likely has access to ro rewly develope portions of the resediment cover stream	rew areas of active cted banks. Majority table (60-80%). Itable (60-80%). Itable (60-80%). AND/OR tures contribute to nakfull and low flow to bankfull benches, ad floodplains along reach. Transient is 10-40% of the bottom.	Often incised, but Poor. Banks more or Poor due to k Erosion may be prototh banks. Vege 40-60% of stream instability. Depositis stability, may be AND/OR V-shap uegetative protect banks and deposit contribute	aggradation) ry ginal less than Severe or stable than Severe over bank slopes. esent on 40-60% of tative protection on Streambanks may recut. AND/OR 40- n is covered by diment may be sisent, contribute on that contribute on that contribute on that contribute on to forming/present. ed channels have ion on > 40% of the ional features which to stability.	Overwidene Vertically/laterally u widen further: Majc are near vertical: 60-80% of bank protection presen banks, and is insuf erosion. AND/OR stream is covere Sediment is temp nature, and contrib AND/OR V-shape vegetative protectic 40% of the ban sediment depos	sd/incised.  Instable. Likely to rity of both banks rosion present on s. Vegetative t on 20-40% of fficient to prevent 6 60-80% of the d by sediment. orary/transient in uiting to instability, d channels have on is present on s ks and stable tition is absent.	Deeply incised vertical/lateral inicision, flow con banks. Streambe rooting depth, m vertical/underc protection present o banks, is not pre Obvious bank slc Erosion/raw ban AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	(or excavated), stability. Severe tatained within the ad below average najority of banks ut. Vegetative on less than 20% of eventing erosion. oughing present. iks on 80-100%. If channels and/or lean flow.	
Channel Condition  Condition  Condition  Condition  Condition  Stable poin are present floodplain bankfull ber and transw sediment de floodplain  Score  NOTES>>  RIPARIAN BUFFER  Tree stratum with 5 60% non-maintair	Optimal  Dision or active erosion; 80 tible banks. Vegetative otection or natural rock, tr (80-100%). AND/OR nt bars/bankfull benches. Access to their original or fully developed wide toches. Mid-channel bars, erse bars few. Transient eposition covers less than 0% of bottom.	Slightly incised, figure of banks are sit vegetative protect prominent (60.0 bepositional feat stability. The bar channels are well likely has access to ro rewly develope portions of the resediment cover stream	rew areas of active cted banks. Majority table (60-80%). Itable (60-80%). Itable (60-80%). AND/OR tures contribute to nakfull and low flow to bankfull benches, ad floodplains along reach. Transient is 10-40% of the bottom.	Often incised, but Poor. Banks more or Poor due to k Erosion may be prototh banks. Vege 40-60% of stream instability. Depositis stability, may be AND/OR V-shap uegetative protect banks and deposit contribute	ginal  less than Severe or stable than Severe over bank slopes, esent on 40-60% of tative protection on Streambanks may recut. AND/OR 40-n is covered by diment may be sisent, contribute on that contribute on that contribute on that contribute on that contribute on that propriesent, ed channels have eight on on > 40% of the ional features which to stability.	Overwidene Vertically/laterally u widen further. Majc are near vertical: 60-80% of bank protection presen banks, and is inside erosion. ANDI/OR stream is covere Sediment is temp nature, and contrib AND/OR V-shape vegetative protectic 40% of the ban sediment depos	sd/incised.  Instable. Likely to rity of both banks rosion present on s. Vegetative t on 20-40% of fficient to prevent 6 60-80% of the d by sediment. orary/transient in uiting to instability, d channels have on is present on s ks and stable tition is absent.	Deeply incised vertical/lateral inicision, flow con banks. Streambe rooting depth, m vertical/underc protection present o banks, is not pre Obvious bank slc Erosion/raw ban AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	(or excavated), stability. Severe tatained within the ad below average najority of banks ut. Vegetative on less than 20% of eventing erosion. oughing present. iks on 80-100%. If channels and/or lean flow.	
Condition 100% sta surface prominen Stable poin are present floodplain bankfull bender and transvisediment de 11 Score NOTES>>  RIPARIAN BUFFER  Riparian Buffers Tree stratum with 5 60% non-maintair	cision or active erosion; 80 bile banks. Vegetative obtection or natural rock, it (80-100%). AND/OR it bars/bankfull benches t. Access to their original or fully developed wide nches. Mid-channel bars, erse bars few. Transient sposition covers less than 0% of bottom.	Slightly incised, ferosion or unproted of banks arest vegetational feat stability. The bar channels are well slikely has access to rewill one or newly develope profession of the resident cover stream	rew areas of active cted banks. Majority table (60-80%). tition or natural rock-80%) AND/OR tures contribute to nkfull and low flow ill defined. Stream to bankfull benches, ad floodplains along reach. Transient rs 10-40% of the bottom.	Often incised, but Poor. Banks more or Poor due to le Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strear sediment. Se temporaryltran instability. Depositi stability, may be AND/OR V-shap vegetative protect banks and deposit contribute	less than Severe or stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may preut. AND/OR 40-n is covered by diment may be sisent, contribute on that contribute on that contribute to forming/present. ed channels have ion on > 40% of the ional features which to stability.	Overwidene Vertically/laterally u widen further. Majc are near vertical: 60-80% of bank protection presen banks, and is inside erosion. ANDI/OR stream is covere Sediment is temp nature, and contrib AND/OR V-shape vegetative protectic 40% of the ban sediment depos	sd/incised.  Instable. Likely to rity of both banks rosion present on s. Vegetative t on 20-40% of fficient to prevent 6 60-80% of the d by sediment. orary/transient in uiting to instability, d channels have on is present on s ks and stable tition is absent.	Deeply incised vertical/lateral inicision, flow con banks. Streambe rooting depth, m vertical/underc protection present o banks, is not pre Obvious bank slc Erosion/raw ban AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	(or excavated), stability. Severe tatained within the ad below average najority of banks ut. Vegetative on less than 20% of eventing erosion. oughing present. iks on 80-100%. If channels and/or lean flow.	
Condition 100% sta surface prominen Stable poin are present floodplain bankfull bender and transvisediment de 11 Score NOTES>>  RIPARIAN BUFFER  Riparian Buffers Tree stratum with 5 60% non-maintair	ble banks. Vegetative otection or natural rock, it (80-100%). AND/OR it bars/bankfull benches. I. Access to their original or fully developed wide riches. Mid-channel bars, erse bars few. Transient eposition covers less than 0% of bottom.	erosion or unprotect of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to ro rewly develope portions of the r sediment cover stream	cted banks. Majority table (60-80%). Itable (60-80%). Itable (60-80%). AND/OR tures contribute to nkfull and low flow to bankfull benches, and floodplains along reach. Transient is 10-40% of the bottom.	Poor. Banks more or Poor due to k Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strear sediment. Se temporary/tran instability. Depositi stability, may be AND/OR V-shap vegetative protect banks and deposit contribute	stable than Severe were bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sisent, contribute on that contribute to forming/present. ed channels have ion on > 40% of the ional features which to stability.	Vertically/laterally u widen further. Majc are near vertical. Ei 60-80% of bank protection presen banks, and is insuf erosion. AND/OR stream is covere Sediment is tempe nature, and contrib AND/OR V-shape vegetative protectic 40% of the ban sediment depos	unstable. Likely to ority of both banks rosion present on ss. Vegetative to no 20-40% of fficient to prevent 6.0-80% of the d by sediment. orary/transient in uiting to instability, d channels have on is present on > sks and stable lition is absent.	vertical/lateral ini- incision, flow con banks. Streambe rooting depth, m vertical/underc protection present o banks, is not pre Obvious bank slc Erosion/raw ban AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread o subterran	stability. Severe tatained within the ad below average ajority of banks tut. Vegetative on less than 20% of eventing erosion, oughing present. kls on 80-100%. g channel. Greater n bed is covered by utility to utility of puting to instability, channels and/or lean flow.	
Condition 100% sta surface prominen Stable poin are present floodplain bankfull bankfull bankfull sediment de 11 Score NOTES>>  RIPARIAN BUFFER  Riparian Buffers Tree stratum with 5 60% non-maintair	ble banks. Vegetative otection or natural rock, it (80-100%). AND/OR it bars/bankfull benches. I. Access to their original or fully developed wide riches. Mid-channel bars, erse bars few. Transient eposition covers less than 0% of bottom.	of banks are st Vegetative protect prominent (60-Depositional feat stability. The bar channels are well the protect of the pro	stable (60-80%), tition or natural rock -80%) AND/OR tures contribute to notfull and low flow all defined. Stream to bankfull and benches, ad floodplains along reach. Transient rs 10-40% of the bottom.	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strear sediment. Se temporary/tran instability. Depositi stability, may be AND/OR V-shap vegetative protect banks and deposit contribute	esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 4n is covered by diment may be sisent, contribute on that contribute on that contribute to forming/present. ed channels have ion on > 40% of the ional features which to stability.	are near vertical. E: 60-80% of bank protection presen banks, and is insuf erosion. AND/OR stream is covere Sediment is temp nature, and contrib AND/OR V-shape vegetative protectic 40% of the ban sediment depos	rosion present on s.s. Vegetative to n 20-40% of fficient to prevent 8 60-80% of the d by sediment. oranyltransient in uting to instability. d channels have n is present on > ks and stable ittion is absent.	vertical/lateral ini- incision, flow con banks. Streambe rooting depth, m vertical/underc protection present o banks, is not pre Obvious bank slc Erosion/raw ban AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread o subterran	stability. Severe tatained within the ad below average ajority of banks tut. Vegetative on less than 20% of eventing erosion, oughing present. kls on 80-100%. g channel. Greater n bed is covered by utility to utility of puting to instability, channels and/or lean flow.	
Score  NOTES>>  RIPARIAN BUFFER  Tree stratum with > 60% non-maintair Buffers	0% of bottom.	seament cover stream	pottom.	vegetative protect banks and deposit contribute	ion on > 40% of the ional features which to stability.	40% of the ban sediment depos	ks and stable ition is absent.	than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by buting to instability. channels and/or nean flow.	
Riparian Buffers  Tree stratum with 5 60% non-maintair			F	ield Sheet		I.	6	1	1	2.4
Riparian Buffers  Tree stratum with 5 60% non-maintain	RS: Assess both ban	nk's 100 foot riparia			12-B-STRM	4.				
Riparian Buffers Tree stratum with > 60% non-maintair	RS: Assess both ban	nk's 100 foot riparia	an areas along the							
Buffers with > 60%			arr aroao along an	e entire SAR. (ro	ugh measuremen	ts of length & widtl	h may be accep	table)		
Buffers with > 60%	Optimal		ditional Cate	gory Marginal		Poor		NOTES>>	-	
	Optimal  High Suboptimal  Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and a maintained understory. Wellands cated within the riparian areas.  Stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  Recent cutover (dense vegetation).		Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas layer (dbh > 3 inches) present, with <30% tree canopy cover.  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas later stratum, hay production, ponds, op meter if present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained		High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.					
		High	Low	High	understory.	High	Low	-		
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5			
Delineate riparian areas a	e for each by measurin	ring or estimating le	ength and width. (	Calculators are pr	ondition Scores using the Calculators are provided for you		ne sums iparian qual 100			
Right Bank % Riparian /							100%			
Score >	> 1.2							CI= (Sum % RA * So	cores*0.01)/2	
Left Bank % Riparian A	Area> 100%						100%	Rt Bank CI >	1.20	CI
Score >								Lt Bank CI >	1.20	1.20
. INSTREAM HABITA ndercut banks; root mats; S				oody and leafy del	oris; stable substra	ate; low embeded	ness; shade;	NOTES>>		
Instream	, , , , , , , , , , , , , , , , , , , ,	_	Conditiona							
Habitat/	Conditional		ptimal ements are typically		ginal ments are typically	Poor Habitat elements				
	Optimal	Stable habitat elements are typically		present in 10-309 are adequate for	% of the reach and or maintenance of	lacking or are un elements are typica	stable. Habitat ally present in less		-	
Score	Optimal  nents are typically present than 50% of the reach.	are adequate fo	lations.		lations.	than 10% of			_	CI

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor N/A CSX R4SB 02080105 12/10/2015 04-STR-25 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. is disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has been guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. CI SCORE 1.5 1.3 1.1 0.9 0.7 0.5 1.10

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View upstream

Top Right: View upstream away from tracks Bottom Left: View downstream toward tracks

Project/Site: DC2RVA - Area 04

NC DWQ Stream Identification Form Version 4.11

Date: 12/10/2015

04-STR-25

Latitude: 37.959917

		1	
County: Carolin	ne County	Longitude: -77	.365311
		Other e.g. Quad Name:	
Absent	Weak	Moderate	Strong
0	1	(2)	3
0	(1)	2	3
0	1	2	3
0	$\bigcirc$	2	3
0			3
			3
0	$\overline{(1)}$		3
0	(1)		3
0		1	1.5
0	0.5	(1)	1.5
N/		Yes =	
	_		
0	1	2	3
0	1	2	3
1.5	1	0.5	0
0	0.5	1	1.5
0	0.5	1	1.5
No	0 = 0	Yes =	= 3
3	2	1	0
(3)	2	1	0
0	1	(2)	3
(0)	1	2	3
0	0.5		1.5
0	0.5		1.5
0	0.5		1.5
0	0.5	1	1.5
	$\triangle$ ACW = 0.75, OB	L = 1.5 Other = 0	)
d	channel ends as it	approaches	* 1
flowing water	structure		1-1
	V )	ber	m
	3	1	
	1-1-1		
	saturated,	dito	ch \
	Jucui uccu,	1	1 1
	but no flow	wood railroad	\_\
	Stream Determine   Ephemeral Interest	0 1 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	Stream Determination (circle one)   Ephemeral Intermittent   e.g. Quad Name:

		Stre				Form for use in Virg	(Fori	m 1)			
5		D N			nels classified a	s intermittent or		045 "	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R2SB	02080105	12/10/2015				
	e(s) of Evaluat tchell, R. Ma	` '	Stream Name	Name and Information 04-STR-26							
	ondition: Asse		etion of the stream	and prevailing c	ondition (erosion		111 20				
					onditional Catego		Po.	or	Sev	oro	
	Optimal		Subo	pullial	- Viai	yillai	Poor		A Sev	ele d	
Channel Condition	Very little incision or active erosion; 80- 100% stable banks. Vegetative		erosion or unproted of banks are st Vegetative protect		Poor. Banks more or Poor due to lo Erosion may be pro both banks. Veget	less than Severe or stable than Severe ower bank slopes. esent on 40-60% of tative protection on Streambanks may		unstable. Likely to prity of both banks rosion present on ks. Vegetative	incision, flow con banks. Streambe	stability. Severe tained within the d below average	
	prominent (80-1) Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba sediment depositio	ole banks. Vegetative protection or natural rock prominent (60-80%), AND/OR bars-bankfull benches. Access to their original or fully developed wide toes. Mid-channel bars, sree bars few. Transient position covers less than 2% of bottom.		bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi stability, may be AND/OR V-shap vegetative protecti banks and depositi	rerut. AND/OR 40- n is covered by diment may be sisent, contribute on that contribute to forming/present. ed channels have on on > 40% of the ional features which to stability.	60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.		rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sle Erosion/raw ban AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of	ut. Vegetative on less than 20% of venting erosion. pughing present. ks on 80-100%. g channel. Greater i bed is covered by uting to instability. channels and/or	CI	
Score	3 2.4		4	2		1.	6	subterran		2.4	
NOTES>>	3	•	1 2		I.	2 12-B-STRM	I.	<u> </u>	<u> </u>		2.4
RIPARIAN			Con	ditional Cate	gory	ugh measuremen		s of length & width may be accept  Poor			
Riparian Buffers	Optimal  Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.		High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, h > 60% tree canopy cover and a -maintained understory. Wetlands and the cover and a concyp cover and a concyp cover and a concyp cover and a concyp cover and a concyp cover and a concyp cover and a concyp cover and a cover and a concyp cover and a cover		L: High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, tree stratum, hay inches) present, tree present present, tree present presen		High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated normaintained area, recently seeded and stabilized, or other comparable condition.				
			High	Low	High	Low	High	Low			
Condition Scores	1.	5	1.2	1.1	0.85	0.75	0.6	0.5			
escriptors.  Determine squelow.	•	ach by measurin	g or estimating le	ngth and width. (	ondition Scores using the Calculators are provided for you		Ensure the of % Ri	iparian			
Right Bank	% Riparian Area> Score >	60% 0.85	40% 0.5					100%	CI= (Sum % RA * S	cores*0.01\/2	
Loft David	% Riparian Area>	80%	20%					100%	Rt Bank Cl >	0.71	CI
Left Bank	Score >	1.1	0.75						Lt Bank CI >	1.03	0.87
INSTREAM	M HABITAT: Va				ody and leafy deb	oris; stable substr	ate; low embeded	ness; shade;	NOTES>>	-	
	TOOL Mats, SAV; II	me poole comple	ones, stable leatul		l Category						
ndercut banks;	root mats; SAV; riffle poole complexes, stable features.  Conditional		Category Poor								
Instream Habitat/	Opti	mal		ptimal ments are typically							
Instream	Opti  Habitat elements all in greater than 50	re typically present	Stable habitat eler present in 30-50% are adequate for	ptimal ments are typically 6 of the reach and r maintenance of ations.	Stable habitat ele present in 10-30% are adequate fo	ginal ments are typically % of the reach and r maintenance of ations.	Habitat elements lacking or are un elements are typica than 10% of	listed above are stable. Habitat ally present in less			CI

	01					D	- 0			
		ream in		ssessm						
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2SB	02080105	12/10/2015	04-STR-26			
<ol><li>CHANNEI embankments, s</li></ol>	L ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, conc			straightening of ch	hannel, channeliz	ation,	NOTES>>	•	
	Negligible	l Mi	Conditiona nor	al Category Mod	erate	Sev	ere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach	20-40% of the stream reach is disrupted by any o the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with ga cem	0% of reach is y of the channel in the parameter JR 80% of banks bion, riprap, or			CI
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5			1.10
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			
NOTE: The CIs and R	RCI should be rounded to 2 decimal places.	The CR should be roun	nded to a whole numb	er.				CONDITION IN		
								I= (Sum of all C		0
								I X LF X IF	\- · · · ·	
							Top Left: Vi	ew downstre from rail	am away	
	Bottom Right: View upstr									
	under privat	e access roac	i							
DESCRIBE F	PROPOSED IMPACT:									

Project/Site: DC2RVA - Area 04

NC DWQ Stream Identification Form Version 4.11

Date: 12/10/2015

04-STR-26

Latitude: 37.957531

Ctroom Determination (single one) Other
Stream Determination (circle one) Ephemeral Intermitted Perennial  e.g. Quad Name:
(Subtotal = 15
bed and bank 0 1 2 3
ong thalweg 0 (1) 2 3
x. riffle-pool, step-pool, 0 1 2 3
substrate 0 1 2 3
0 1 2 3
enches 0 1 <b>(2)</b> 3
s 0 <u>1</u> (2) 3
0 1 2 3
0 0.5 1 1.5
0 0.5 1.5
der channel No = 0 (Yes = 3)
ed; see discussions in manual
tal = 10
v 0 1 (2) 3
a 0 1 (2) 3
1.5 1 0.5 0
r debris 0 0.5 (1) 1.5
or piles 0 0.5 1.5
of high water table? No = 0 Yes = 3
= 11.25
mbed (3) 2 1 0
in streambed 3 2 1 0
iversity and abundance) 0 (1) 2 3
(0) 1 2 3
0 0.5 1 1.5
0 0.5 1 (1.5)
0 0.5 1 1.5
0 0.5 1 1.5
eambed EACW = 0.75, OBL = 1.5 Other = 0
o be identified using other methods. See p. 35 of manual.
road ballast. Culvert 6 at access road to house. Field Sheet 12-B-STRM5.
eambed  O  OBL = 1.5 Other  obe identified using other methods. See p. 35 of manual.

			Unit	fied Stream N	lethodology f	or use in Virg					
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	04	VA	R2SB	02080105	12/15/2015		length	1 dotor	
Name	e(s) of Evalua	tor(s)	Stream Nam	e and Informa							
	K. Astroth			04-STR-27 (Polecat Creek)							
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream		ondition (erosion,						
	Opt	imal	Subo	ptimal		ginal	Poor		Sev	ere	
	" we want of the same of the s					less than Severe or	Overwidene		1	5	
Channel Condition	Very little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient		erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	tion or natural rock -80%) AND/OR tures contribute to akfull and low flow Il defined. Stream to bankfull benches, d floodplains along	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may errut. AND/OR 40- n is covered by diment may be sisent, contribute on that contribute to forming/present.	widen further. Maji are near vertical. E 60-80% of banl protection preses banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contriš	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the bed by sediment. orary/transient in outing to instability.	incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sl Erosion/raw ban	stability. Severe tained within the ed below average hajority of banks ut. Vegetative on less than 20% of eventing erosion. Dughing present. ks on 80-100%.	
	sediment deposition covers less than 10% of bottom.  politions of the leads. Transient sediment covers 10-40% of the stream bottom.		AND/OR V-shaped channels have vegetative protection on > 40% of the		AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.				C		
Score	3	3	2	2.4 2		2	1.6		1		3.0
NOTES>>	I DUEEEDO.			-				ecat Creel			
	N BUFFERS: /		c's 100 foot riparia	-	e entire SAR. (roo			h may be accep			
	Opti Tree stratum (dbh: with > 60% tree ca	Assess both bank  imal  > 3 inches) present, anopy cover and a destory. Wetlands	c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep	table)		
2. RIPARIAN Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cu. non-maintained un	Assess both bank  imal  > 3 inches) present, anopy cover and a destory. Wetlands	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	table)		
2. RIPARIAN	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	Assess both bank  imal  > 3 inches) present, anopy cover and a destory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	table)		
Riparian Buffers  Condition Scores  1. Delineate ripa descriptors. 2. Determine squeedles.	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2	categories and congth and width. Congth and widt	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	table)		
Riparian Buffers  Condition Scores  1. Delineate ripa descriptors. 2. Determine squeedles.	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area>	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.	Con Subor  High Suboptimal: Riparian areas with tree stratum (doh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 35%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/stree-canopy.cover.">https://doi.org/10.100/stree-canopy.cover.</a> High  0.85  Addition Scores us Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	table)		
Riparian Buffers  Condition Scores  1. Delineate ripadescriptors. 2. Determine squelow. 3. Enter the % F	Tree stratum (dbh: with > 60% tree conon-maintained un located within th	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provinced.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	table)	cores*0.01)/2	
Riparian Buffers  Condition Scores  1. Delineate ripalescriptors. 2. Determine squelow. 3. Enter the % F	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area>	imal  > 3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5  each stream ban each by measurin 20% 1.5	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 35% 0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/">30% tree canopy cover.</a> High  0.85  Audition Scores us Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	table)  NOTES>>  Cl= (Sum % RA * Si  Rt Bank Cl >	0.92	CI
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine squelow. 3. Enter the % F Right Bank	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  20%  1.5	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 35% 0.85	an areas along the ditional Categories and Congth and width. Congt	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the second of the second	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel folist, trails, or other comparable conditions.  Low 0.5  Low 95%	CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI >		CI 1.1
Condition Scores  1. Delineate ripa descriptors. 2. Determine so pollow. 3. Enter the % F Right Bank  Left Bank  3. INSTREAN	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5  each stream ban each by measurin 20% 1.5  75% 1.5  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 35% 0.85	an areas along the ditional Categories and Council Categories and Categories and Council Categories and Catego	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the second of the second	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel folist, trails, or other comparable conditions.  Low 0.5  Low 95%	table)  NOTES>>  Cl= (Sum % RA * Si  Rt Bank Cl >	0.92	
Condition Scores  1. Delineate ripa descriptors. 2. Determine so pollow. 3. Enter the % F Right Bank  Left Bank  3. INSTREAN	Tree stratum (dbh: with > 60% tree ca non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Score >  W HABITAT: V: root mats; SAV; r	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  .5  each stream ban each by measurin 20% 1.5  75% 1.5  aried substrate si iffle poole comple	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 35% 0.85	an areas along the ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Coungth and width. Coungth and width. Coungth and width. Coungth and width. Coungth and width. Coungth and width. Coungth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the condition of the condition	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (bdh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  100%  100%	CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI >	0.92	
Condition Scores  L. Delirenate rips descriptors. Delineate rips descriptors. Endes rips descriptors. Left Bank  Left Bank  Left Banks  Instream Habitat/	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  M HABITAT: Vi root mats; SAV; r	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5  each stream ban each by measurin 20% 1.5  75% 1.5  aried substrate si iffle poole completimal	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category it 35% 0.85  25% 1.1  zes, water velocit ixxes, stable featur  Subop Stable habitat elei	an areas along the ditional Categories and Council Categories and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Acalculators are proved. 20%  1.1  Category  Marginal Category  Marginal Marginal Category  Stable habitat ele	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks et  Blocks et  High  Deliver the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 95%  100%  100%  1isted above are	CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI >	0.92	
Condition Scores  1. Delineate ripa descriptors. 2. Determine so polow. 3. Enter the % F Right Bank  Left Bank  3. INSTREAN undercut banks; Instream	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  M HABITAT: Vi root mats; SAV; r	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  .5  each stream ban each by measurin 20% 1.5  75% 1.5  aried substrate si iffle poole completimal are typically present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 35% 0.85  25% 1.1  zes, water velocit exes, stable featur Subo Stable habitat ele present in 30-50% are adequate fo	un areas along the ditional Categorithmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and width. Congth and depths; wores.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided in the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  provided for you  oris; stable substr	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 95%  100%  100%	CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI >	0.92	

	St	ream In	npact A	ssessm	ent For	m Page	2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02080105	12/15/2015	04-STR-27		
	LALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, spoil piles, constrictions, livestock  Conditional Category								
	Negligible	Mir	nor	Moderate			Severe		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	is disrupted by any of the channel	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with ga cem	of the channel in the parameter PR 80% of banks bion, riprap, or		
	1.5	1.3	1.1	0.9	0.7	0.	-	1	

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View upstream Top Right: View across Polecat Creek at upstream side of railroad bridge Bottom Left: View slightly upstream under railroad bridge from downstream side Bottom Right: View downstream from under railroad bridge

NC DWQ Stream Identification Form Version 4.11 Polecat Creek 04-STR-27

Date: 12/15/2015	Project/Site: DC2RVA - Area 04	Latitude: 37.956259
Evaluator: K. Astroth	County: Caroline County	Longitude: -77.387823
<b>Total Points:</b> 40.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

0	Weak	Moderate	Strong
	1	2	3
0	1	(2)	3
0	1	2	3
0	(1)	2	_3
0	1		3
0	1	(2)	3
0	1	(2)	3
0	1	2	3
0	0.5	1	1.5
0	0.5	1	1.5
No	= 0	Yes:	= 3
0	1	2	(3)
0	1	2)	3
1.5	1	0.5	0
0	0.5	1	1.5
0	0.5	1	1.5
No	= 0	Yes:	= 3
3	(2)	1	0
(3)	2	1	0
9	1	(2)	3
0	1	2	3
0	0.5	1	1.5
0	0.5	1	1.5
0	0.5	$\mathbb{B}$	1.5
0	0.5		1.5
	FACW = 0.75	OBL = 1.5 Other = 0	)
. See p. 35 of manual	<b>.</b>		
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 0 1 0 0 1 0 0.5 0 0.5 No = 0   1 0 0 0.5 No = 0  1 0 0.5 No = 0  1 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5	0 1 2 2 0 1 0 1 2 0 0 1 2 0 0 0.5 1 0 0 0.5 1 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

		Stre		SSESS fied Stream M			-	III I <i>)</i>		
Dunic - t d'		Drainet Name		wadeable chan	nels classified a			CAD#	Impact/SAR	Impact
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor
N/A		2RVA - Area		VA e and Informa	R2SB	02080105	12/15/2015			
Nam	ne(s) of Evaluate  K. Astroth	tor(s)	Stream Nam	e and informa		TR-28	(Polecat (	rook)		
. Channel (	Condition: Asse	ess the cross-sec	tion of the stream	and prevailing co			(i oiceat (	Jicck)		
	Opti				onditional Catego		Po	or	Sev	ere
	1	Who have a second	1		Often incised, but	less than Severe or	Overwiden	ed/incised.	1	5
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	n or natural rock, 00%). AND/OR bankfull benches as to their original developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are stogetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to rewly develope	ew areas of active table (60-80%). tion or natural rock -80%) AND/OR urres contribute to ktfull and low flow Il defined. Stream o bankfull benches, of floodplains along each. Transient	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran instability. Depositi	stable than Severe ower bank slopes. seent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sisent, contribute to to forming/present.	widen further. Maj	ority of both banks rosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. orary/transient in buting to instability.	Deeply incised vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank slice Erosion/raw ban AND/OR Aggradin.	stability. Severe tained within the ed below average hajority of banks ut. Vegetative on less than 20% of eventing erosion. Doughing present. ks on 80-100%.
	sediment depositio		sediment cover	s 10-40% of the bottom.	vegetative protecti banks and deposit	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depor	nks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or
Score	3		l	.4		2	1.		-04, Polecat	
							am.			
. RIPARIA	N BUFFERS: A		Con	ditional Cate	gory		ts of length & wid		table)	
RIPARIAI Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree care	imal  - 3 inches) present, anopy cover and a derstory. Wetlands	Con		gory	Ginal  Low Marginal:  Non-maintained, dense herbaceous vegetation,				
Riparian Buffers	Option  Tree stratum (dbh > with > 60% tree canon-maintained uncon-maintained unco-maintained	imal  - 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Catec ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ir parian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or ofther comparable		
Riparian	Option  Tree stratum (dbh > with > 60% tree canon-maintained uncon-maintained unco-maintained	imal 3 inches) present, anopy cover and a derstory. Wellands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Categotimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or of other comparable conditions.		
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine so	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a deferstory. Wellands e riparian areas.  5  each stream banl ach by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating leparian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutore (dense vegetation).  Low  1.1  Lategories and Co ngth and width. Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are prov.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded dust, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100		
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine so	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a deterstory. Wellands e riparian areas.  5  each stream band ach by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 35%	ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with > 30% tree canopto cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. Con the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prov.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5		
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow.	Tree stratum (dbh with > 60% tree ca non-maintained und located within the located within the located areas along or or a reas n or or or or or or or or or or or or or	imal  3 inches) present, anopy cover and a deferstory. Wellands e riparian areas.  5  each stream banl ach by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating leparian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutore (dense vegetation).  Low  1.1  Lategories and Co ngth and width. Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are prov.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded dust, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100		cores*0.01)/2
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine selow. Enter the %	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a defensiory. Wetlands eriparian areas.  5  each stream bani ach by measurin  Score for each ri  20%  1.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 35% 0.85	ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with > 30% tree canopto cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. Con the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prov.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded dust, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	0.92
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine seelow. Enter the % Right Bank  Left Bank	Tree stratum (dbh > with > 60% tree cc onon-maintained und located within the located wit	simal  3 inches) present, anopy cover and a derstory. Wetlands er liparian areas.  5  each stream bani ach by measurin  20%  1.5  75%  1.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 35% 0.85	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. Co n the blocks belov 20% 0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are proved.  20%  1.1	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 95%	NOTES>>	,
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine seelow. Enter the % Right Bank  Left Bank	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands er liparian areas.  5  each stream bank ach by measurin 20% 1.5  75% 1.5  aried substrate si iffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 35% 0.85	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Acalculators are prov.  20%  1.1	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  Sing the rovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 95%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	0.92
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine selow. Enter the % Right Bank  Left Bank  Instream Habitat/	Tree stratum (dbh > with > 60% tree cc conon-maintained und located within the located wi	imal  3 inches) present, anopy cover and a derstory. Weltands e riparian areas.  5  each stream bani ach by measurin  Score for each ri  20%  1.5  75%  1.5  aried substrate si fffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category it 35% 0.85  25% 1.1  zes, water velocit exes, stable featu  Subo  Stable habitat ele	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. Co n the blocks below 20% 0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  sing the rovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel olts, trails, or other comparable conditions.  Low 0.5  Low 95%  100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	0.92
Condition Scores  Delineate rip escriptors. Determine so elow. Enter the % Right Bank  Left Bank  INSTREA	Tree stratum (dbh > with > 60% tree cc conon-maintained und located within the located wi	imal  3 inches) present, anopy cover and a derstory. Wetlands er liparian areas.  5  ach stream bank ach by measurin  20%  1.5  75%  1.5  aried substrate si fiftle poole completimal  re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 35% 0.85  25% 1.1  zes, water velocitixes, stable features, stable features suboptim	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Acalculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  rovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 95%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >  NOTES>>	0.92

	St	ream In	npact A	ssessm	ent For	m Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	csx		VA	R2SB	02080105	12/15/2015	04-STR-28			
4. CHANNEI	L ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of ch	nannel, channeliz	ation,	NOTES>>		
embankments, s	poil piles, constrictions, livestock		Conditiona							
	Negligible	Mi	nor	40 - 60% of reach is disrupted by any	60 - 80% of reach is disrupted by any	Sev	ere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with gal cem	y of the channel in the parameter DR 80% of banks bion, riprap, or			CI
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5			1.50
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			
NOTE: The CIs and R	RCI should be rounded to 2 decimal places. T	he CR should be roun	ded to a whole number	er.				CONDITION IN		
					ĺ			I= (Sum of all CION REQUIRE)		0
								I X LF X IF		
INSERT PHO	OTOS:									! 
DESCRIBE F	PROPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11 Polecat Creek 04-STR-28

Project/Site: DC2RVA - Area 04

Latitude: 38.956233

1.5

Evaluator: K. Astroth	County: Caroline	e County	Longitude: -77	'.387308
<b>Total Points:</b> 40.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	
	Allegand	\A/1	Ba denete	04
A. Geomorphology (Subtotal = 17 )	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1)	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts		1	2	3
9. Grade control	0	0.5	$\bigcirc$	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 11 )				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes:	= 3
C. Biology (Subtotal = 12.5				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)		1	(2)	3
21. Aquatic Mollusks	0	1	2	3
22. Fish		0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5		1.5

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: No Field Sheet, this data sheet taken from 12-A-STR-04 which is an arm of this stream.

Sketch:

25. Algae

26. Wetland plants in streambed

Date: 12/15/2015

0.5

FACW = 0.75 OBL = 1.5 Other = 0

		Stre	Unit	fied Stream M	lethodology f	or use in Virg		m 1)				
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor		
N/A	DC	C2RVA - Area	04	VA	R4SB	02080105	12/15/2015		isiigiii	ractor		
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation	l.	L					
	K. Astroth					04-S	ΓR-29					
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream									
	Opt	imal	Subo	ptimal	onditional Catego Mar	ginal	Po	or	Sev	ere		
	Very little incision or active erosion; 80- 100% stable banks. Vegetative				Often incised, but less than Severe or		Overwiden		1	5		
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	inks. Vegetative in or natural rock, 100%). AND/OR /bankfull benches less to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	ew areas of active toted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, of floodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe were bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.		stability. Severe tained within the de below average hajority of banks ut. Vegetative on less than 20% of venting erosion. Dughing present. ks on 80-100%.		
	sediment deposition 10% of	on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depos	ks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	С	
Score	3	3	2	.4		2	1.	6	1		2.4	
2. RIPARIAI	N BUFFERS: /		Con	ditional Cate	gory		ts of length & wid		ntable)			
2. RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anderstory. Wetlands	Con		gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (6th > 3 inches) present, with <a href="https://www.aintained">with <a "="" 10.100="" 20="" ar="" doi.org="" href="https://www.aintaine&lt;/th&gt;&lt;th&gt;&lt;/th&gt;&lt;th&gt;&lt;/th&gt;&lt;th&gt;&lt;/th&gt;&lt;th&gt;&lt;/th&gt;&lt;th&gt;&lt;/th&gt;&lt;/tr&gt;&lt;tr&gt;&lt;td&gt;Riparian&lt;br&gt;Buffers&lt;/td&gt;&lt;td&gt;Opti Tree stratum (dbh : with &gt; 60% tree cr. non-maintained un&lt;/td&gt;&lt;td&gt;imal  &gt; 3 inches) present, anderstory. Wetlands&lt;/td&gt;&lt;td&gt;Con Subo High Suboptimal: Riparian areas with tree stratum (dbh &gt; 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained&lt;/td&gt;&lt;td&gt;ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh &gt; 3 inches) present, with &gt; 30% tree canopy cover and a maintained understory, Recent cutover (dense&lt;/td&gt;&lt;td&gt;High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh &gt; 3 inches) present, with &lt;30% tree&lt;/td&gt;&lt;td&gt;ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh &gt; 3 inches) present, with &lt;30% tree canopy cover with maintained&lt;/td&gt;&lt;td&gt;High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable&lt;/td&gt;&lt;td&gt;Low Poor:&lt;br&gt;Impervious&lt;br&gt;surfaces, mine&lt;br&gt;spoil lands,&lt;br&gt;denuded&lt;br&gt;surfaces, row&lt;br&gt;crops, active feed&lt;br&gt;lots, trails, or&lt;br&gt;other comparable&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;/tr&gt;&lt;tr&gt;&lt;td&gt;Riparian&lt;/td&gt;&lt;td&gt;Opti Tree stratum (dbh: with &gt; 60% tree cc non-maintained un located within th&lt;/td&gt;&lt;td&gt;imal  &gt; 3 inches) present, anderstory. Wetlands&lt;/td&gt;&lt;td&gt;Con Subo High Suboptimal: Riparian areas with tree stratum (dbh &gt; 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.&lt;/td&gt;&lt;td&gt;ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh &gt; 3 inches) present, with &gt; 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).&lt;/td&gt;&lt;td&gt;High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh &gt; 3 inches) present, with &lt;30% tree canopy cover.&lt;/td&gt;&lt;td&gt;ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. 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Low  0.5  he sums iparian qual 100&lt;/td&gt;&lt;td&gt;NOTES&gt;&gt;&lt;/td&gt;&lt;td&gt;1.05&lt;/td&gt;&lt;td&gt;CI&lt;br&gt;1.0&lt;/td&gt;&lt;/tr&gt;&lt;tr&gt;&lt;td&gt;Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. Right Bank  Left Bank  3. INSTREAL&lt;/td&gt;&lt;td&gt;Tree stratum (dbh: with &gt; 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area&gt; Score &gt;  % Riparian Area&gt; Score &gt;  M HABITAT: Vi&lt;/td&gt;&lt;td&gt;imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin  Score for each ri  85%  1.1  40%  1.2  aried substrate si&lt;/td&gt;&lt;td&gt;Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh &gt; 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  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If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >		CI 1.0
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the %  Right Bank  Left Bank  3. INSTREAl undercut banks;	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin  Score for each ri  85%  1.1  40%  1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Kinto Condition C g or estimating le parian category it 5% 0.85  45% 1.1	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. ( n the blocks belov  1.75  5% 0.85  ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Acalculators are provided to the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 1005  Low 1007  Low 1009  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.05		
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin  Score for each ri  85%  1.1  40%  1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 5% 0.85  45% 1.1  zes, water velocit exes, stable featur	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. ( In the blocks below 10% 0.75  5% 0.85  by and depths; wo res.  Conditiona ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicate of the control of the c	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hap production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5   NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.05			
Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree conon-maintained un located within th  1.  arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> root mats; SAV; r  Opti Habitat elements a	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bank each by measurin Score for each ri 85% 1.1  40% 1.2  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 5% 0.85  45% 1.1  zes, water velocit exes, stable featur  Subo  Stable habitat elpresent in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 1.0% 0.75  5% 0.85  ty and depths; wores.  Conditional ments are typically % of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Acalculators are proved the control of the cont	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically % of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en  Habitat elements lacking or are ur	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >  NOTES>>	1.05	1.0	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi. root mats; SAV; r  Opti Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bank each by measurin Score for each ri 85% 1.1  40% 1.2  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Kinto Condition C g or estimating le parian category it 5% 0.85  45% 1.1  zes, water velocit exes, stable featur  Subo Stable habitat ele present in 30-50y are adequate fo popul	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 10% 0.75  5% 0.85  ty and depths; wo res.  Conditional ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to f % R Blocks end	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >  NOTES>>	1.05		

	St	ream In	npact A	ssessm	ent Fo	rm Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB	02080105	12/15/2015	04-STR-29		
	ALTERATION: Stream cross poil piles, constrictions, livestock			al Category	straightening of cl		ation,	NOTES>>	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any	0% of reach is y of the channel in the parameter JR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF 0

### INSERT PHOTOS:



Typical view of stream

ECCDIDE	DDODOSED	IMDACT.

NC DWQ Stream Identification Form Version 4.11

<b>Date:</b> 12/15/2015	Project/Site: DC2RVA - Area 04	Latitude: 37.959739
Evaluator: K. Astroth	County: Caroline County	Longitude: -77.415710
<b>Total Points:</b> 24.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 9.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0_	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1_	(2)	3
7. Recent alluvial deposits	0	<u> </u>	2	3
8. Headcuts	0	<b>①</b>	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	o = 0	Yes :	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual			1	
B. Hydrology (Subtotal = 6				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	0	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	0	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes :	= 3
C. Biology (Subtotal = $9$				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	)	1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	(a)	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other methods.	See p. 35 of manua	al.		
Notes: Tributary to Mill Run. Flows into Culvert 3. Fig.	eld Sheet 12-A-	·STR-03.		
Sketch: Culve	ert	<b>\</b>	FLOW	

		Stre	Unit	fied Stream N	lethodology f	or use in Virg					
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	04	VA	R4SB	02080105	12/15/2015		lengui	ractor	
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
	K. Astroth					04-S	ΓR-30				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream		ondition (erosion,						
	Opt	imal	Subo	ptimal		ginal	Po	or	Sev	ere	
	Very little incision or active erosion; 80- 100% stable banks. Vegetative					less than Severe or	Overwidene		1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	inks. Vegetative in or natural rock, 100%). AND/OR /bankfull benches less to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	ew areas of active ted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR ures contribute to ktfull and low flow II defined. Stream o bankfull benches, of floodplains along each. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the bed by sediment. orary/transient in outing to instability.	Deeply incised vertical/lateral ininicision, flow con banks. Streambe rooting depth, m vertical/lunderc protection present c banks, is not pre Obvious bank sit Erosion/raw ban AND/OR Aggrading	stability. Severe tained within the dd below average apority of banks ut. Vegetative in less than 20% of venting erosion. bughing present. ks on 80-100%.	
		on covers less than bottom.	sediment cover	s 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have on on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depos	iks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	С
Score	3	3	2	.4		2	1.	6	1		3.0
NOTES>>	N RIIEEEDS:				o ontiro SAP (ro		·	ry to Mill R	•		
	N BUFFERS: /		c's 100 foot riparia		gory		·	h may be accep	•		
	Opti Tree stratum (dbh: with > 60% tree ca	Assess both bank  imal  > 3 inches) present, anopy cover and a deststory. Wetlands	c's 100 foot riparia	an areas along the	gory	ugh measuremen	ts of length & widt	h may be accep	table)		
2. RIPARIAN Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cr. non-maintained un	Assess both bank  imal  > 3 inches) present, anopy cover and a deststory. Wetlands	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	table)		
2. RIPARIAN	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	Assess both bank  imal  > 3 inches) present, anopy cover and a deststory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	table)		
Riparian Buffers  Condition Scores  1. Delineate ripr descriptors. 2. Determine scorelow.	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition Co	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are presented.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	table)		
Riparian Buffers  Condition Scores  1. Delineate ripr descriptors. 2. Determine scorelow.	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 45%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	table)		
Riparian Buffers  Condition Scores 1. Delineate ripedescriptors. 2. Determine scoelow. 3. Enter the % I	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of t	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Kinto Condition Co g or estimating le parian category in	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	table)	cores*0.01)/2	
Riparian Buffers  Condition Scores  1. Delineate ripa descriptors. 2. Determine scoelow. 3. Enter the % F	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5  each stream bank each by measurin 20% 1.1  35%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 45% 0.85	to a reas along the ditional Categories and County Recent cutover (dense vegetation).  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and County Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	table)  NOTES>>  Cl= (Sum % RA * Si  Rt Bank Cl >	0.82	CI
Condition Scores  1. Delineate rip descriptors. 2. Determine soelow. 3. Enter the % f Right Bank	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5  each stream bank ach by measurin Score for each ri 20% 1.1  35% 1.1	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 45% 0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low 1.1  categories and Co ngth and width. ( n the blocks below 15% 0.75	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel folist, trails, or other comparable conditions.  Low 0.5  Low 10.5   table)  NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >		CI 0.83	
Condition Scores  1. Delineate ript Jescriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5 each stream bank each by measurin 20% 1.1 35% 1.1 aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 45% 0.85  30% 0.85	to a reas along the ditional Categories and County Recent cutover (dense vegetation).  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and County American County American County Recent Cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel folist, trails, or other comparable conditions.  Low 0.5  Low 10.5   table)  NOTES>>  Cl= (Sum % RA * Si  Rt Bank Cl >	0.82		
Condition Scores  1. Delineate ript Jescriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree ca non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Score >  W HABITAT: Va root mats; SAV; r	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  .5  each stream bank each by measurin 20% 1.1  35% 1.1  aried substrate si iffle poole comple	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 45% 0.85  30% 0.85  zes, water velocit exes, stable features	to a reas along the ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Coungth and width. Coungth and width. Coungth and width. Coungth and width. Coungth and width. Coungth and width. Coungth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided to the condition of the condition	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	table)  NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.82	
Condition Scores  L. Delineate rips descriptors. Left Bank  Left Bank  Left Banks  Instream Habitat/	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  W HABITAT: V: root mats; SAV; r	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5  each stream bank each by measurin 20% 1.1  35% 1.1  aried substrate si iffle poole comples imal	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category it 45% 0.85  30% 0.85  zes, water velocit exes, stable featur  Subop Stable habitat elei	to a reas along the ditional Categories and Council Categories and Catego	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85 Calculators are provided to the control of the co	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks et  Blocks et  High  Deliver the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	table)  NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.82	
Condition Scores  1. Delineate ripz descriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank 3. INSTREAI undercut banks; Instream	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  W HABITAT: V: root mats; SAV; r	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  .5  each stream bank each by measurin 20% 1.1  35% 1.1  aried substrate si iffle poole completimal are typically present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 45% 0.85  30% 0.85  zes, water velocit exes, stable featur Subo Stable habitat ele present in 30-50% are adequate fo	un areas along the ditional Categorithmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and depths; wores.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Calculators are provided in the control of the c	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	table)  NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.82	

	St	ream In	nnact A	2222m	nent Foi	m Pag	a 2			
Project #	Applicant	realli ili	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R4SB	02080105	12/15/2015		O/at long	impact ractor	-
	L ALTERATION: Stream cross	sings, riprap, conc						NOTES>>		
	poil piles, constrictions, livestock	90,p.ap, 00.10		al Category						
	Negligible	Mi	nor		lerate	Sev	/ere			
					is disrupted by any					
Channel		Less than 20% of the stream reach	20-40% of the stream reach is	of the channel alterations listed in			80% of reach is			
Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an	is disrupted by any of the channel	disrupted by any o the channel	guidelines. II	the parameter guidelines. If stream has been	alterations listed	y of the channel in the parameter DR 80% of banks			
	unaltered pattern or has naturalized.	alterations listed in the parameter	the parameter	channelized, normal stable	channelized, normal stable	shored with ga	bion, riprap, or nent.			
		guidelines.	guidelines.	stream meander pattern has not	stream meander pattern has not					
SCORE	1.5	1.3	1.1	recovered.	recovered.	0	.5			1.30
OCCINE					NDITION UN			1		1.50
NOTE: The CIs and R	RCI should be rounded to 2 decimal places.							CONDITION IN	DEX (RCI) >>	
								I= (Sum of all C		
								ION REQUIRE	WENT (CR) >>	0
INSERT PHO	TOS:									
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DESCRIBE F	PROPOSED IMPACT:									

Project/Site: DDC2RVA - Area 04 Latitude: 37.959960

NC DWQ Stream Identification Form Version 4.11

Date: 12/15/2015

	,			
Evaluator: K. Astroth	County: Carolin	e County	Longitude: -77	.418667
Total Points: 23	Stream Determi	nation (circle one)	Other	
Stream is at least intermittent	Ephemeral Inte	rmittent Perennial	e.g. Quad Name:	
if ≥ 19 or perennial if ≥ 30*			orga quantumos	
A. Geomorphology (Subtotal = 10	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool,				
ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	( No	0 = 0	Yes =	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = <u>5.5</u> )				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	(No	0 = 0	Yes =	= 3
C. Biology (Subtotal = 7.5)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	8	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	(7)	0 <u>.5</u>	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	
*perennial streams may also be identified using other method	ods. See p. 35 of manua	ıl.		
Notes: Tributary to Mill Run. Banks are not well o	defined. Culvert 2 is	under water. Field	Sheet 12-A-STF	₹-01.
-				
	culvert 2,	111		
Sketch:	04110112	0		
	125 -> 0	g		
/	7	ballast		
-25	47/5/	E SS		
	1	Š   Š		
	1	0		
rai	sed area	1 1 1 1		

		Stre	Uni	fied Stream M	lethodology f	or use in Virg		m 1)			
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or	Date Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	04	VA	R2SB	02080105	12/17/2015		lengin	1 dotoi	
Name	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
	K. Astroth				04	-STR-3	1 (Mill R	un)			
1. Channel C	ondition: Asse	ess the cross-sec	tion of the stream			dition (erosion, aggradation) nditional Category					
	Opti	imal	Subo	ptimal		ginal	Po	or	Sev	ere	
	Very little incision or active erosion; 80-		Slightly incised, few areas of active		Often incised, but less than Severe or				1	5	
Channel Condition	surface protection prominent (80-1 Stable point bars/	nks. Vegetative n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are stylegetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to riewly develope	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, d floodplains along	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may errut. AND/OR 40- n is covered by diment may be sisent, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. orary/transient in buting to instability.	roting depth, r vertical/underc rooting depth, r vertical/underc protection present of banks, is not pre Obvious bank sla Erosion/raw ban	stability. Severe tained within the do below average hajority of banks ut. Vegetative on less than 20% of venting erosion. Dughing present. ks on 80-100%.	
	sediment deposition 10% of	on covers less than	sediment cover	reach. Transient rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar	on is present on > nks and stable	AND/OR Aggradin than 80% of stream deposition, contrib Multiple thread subterran	n bed is covered by outing to instability. channels and/or	С
Score	3			.4		2	1.		1		2.0
NOTES>>	12-4	A1-STR-06:	Missing tie		nformation hich is the			et 12-A-S1	R-02 (Mill R	un),	
2. RIPARIAN	BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	th may be accep	table)		
	Opti	imal		ditional Cate		ginal	Po	٥,	NOTES>>		
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
			High	Low	High	Low	High	Low			
Condition Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
descriptors. 2. Determine squelow.	arian areas along ouare footage for e	each by measurin	g or estimating le	ngth and width. (	Calculators are pr	•	Ensure to of % R Blocks e	iparian			
Right Bank	% Riparian Area>	70% 1.2	15% 1.1	15% 0.5				100%			
	ocore >	1.2	1.1	0.5					CI= (Sum % RA * S	cores*0.01)/2	
Left Bank	% Riparian Area>	100%						100%	Rt Bank CI >	1.08	CI
3. INSTREAM	Score >  // HABITAT: Va				ody and leafy deb	oris; stable substr	ate; low embeded	lness; shade;	Lt Bank CI >	1.20	1.1
	root mats; SAV; r	iiie pooie comple	exes, stable featu	res. Conditiona	I Category						
Instream Habitat/	Opti	imal		ptimal		ginal ments are typically	Po Habitat elements				
Available Cover	Habitat elements a in greater than 5	re typically present 0% of the reach.	present in 30-509	ments are typically % of the reach and r maintenance of	present in 10-309	ments are typically % of the reach and or maintenance of	lacking or are ur elements are typic	stable. Habitat		_	
Score	1.		popul	ations.	popul	ations.	than 10% o	f the reach.			1.2
50016	<u> </u>		<u>'</u>				. 0.		l		1.2

	St	ream In	npact A	ssessm	ent Fo	m Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2SB	02080105	12/17/2015	04-STR-31			
4. CHANNEI	L ALTERATION: Stream cross	ings, riprap, conc	crete, gabions, or	concrete blocks,	straightening of cl	hannel, channeliz	ation,	NOTES>>		
embankments, s	poil piles, constrictions, livestock		Conditiona							
	Negligible	Mi	nor		erate	Sev	ere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		of the channel in the parameter PR 80% of banks bion, riprap, or			CI
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5			1.50
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN					
NOTE: The CIs and R	RCI should be rounded to 2 decimal places. T	The CR should be roun	nded to a whole numb	er.				CONDITION IN		
						(		I= (Sum of all C		0
						<u> </u>		I X LF X IF	(***)	
INSERT PHO	TOS:									
DESCRIBE F	PROPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11

Mill Run

Date: 12/17/2015	Project/Site: D0	C2RVA - Area 04	Latitude: 38.96	60622
Evaluator: K. Astroth	County: Carolin	ne County	Longitude: -77	7.421842
<b>Total Points:</b> 31.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermitten Perennia		
A. Geomorphology (Subtotal = 14.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0		2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	(1)		3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5	1 _	1.5
11. Second or greater order channel	N	0 = 0	Yes	
a artificial ditches are not rated; see discussions in manual	l .	l		
B. Hydrology (Subtotal = <u>6.5</u> )				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	= 3
C. Biology (Subtotal = 10.75				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)		1	(2)	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	7	0.5	1)	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		ACW = 0.75 C	BL = 1.5 Other = 0	)
*perennial streams may also be identified using other method	ds. See p. 35 of manua	al.		
Notes: Missing field sheet, Information taken from	Field Sheet 12-A	-STR-02 (Mill Rur	n), which is the sar	me stream.
1	Open Woods	(	down tree	
Sketch:			11	
	FLC		/	
1		1		
		1		
incised bank/erosio	on .			
V 3-53-7-3-7-1	Open W	/oods		
	Ballast/Tra	cks		

		Otile		SSESS fied Stream M	ment lethodology f			m 1)			
					nels classified a						
Project #	ı	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area		VA	R2SB	02080105	12/17/2015				
Nam	e(s) of Evaluate  K. Astroth	tor(s)	Stream Nam	e and Informa		LSTR-3	2 (Mill R	un)			
1. Channel C	Condition: Asse	ess the cross-sec	ction of the stream	and prevailing co			<b>Z</b> (141111 1X	uii)			
	Opti				onditional Catego		Po	or	Sev	/ere	
	· J	W.	1	ر ا		less than Severe or	Overwidene		1	5	
Channel Condition	Very little incision or 100% stable ban surface protection prominent (80-1 Stable point bars' are present. Acce floodplain or fully bankfull benches. and transverse ba sediment depositio	nks. Vegetative n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are stogetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to or newly develope	ew areas of active ted banks. Majority table (60-80%). ion or natural rock. 80%). AND/OR ures contribute to ikfull and low flow Il defined. Stream o bankfull benches, of floodplains along each. Transient	or Poor due to lo Erosion may be pri both banks. Vegei 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositio stability, may be	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Majc are near vertical. E 60-80% of bank protection preser banks, and is insult erosion. AND/OR stream is covere Sediment is tempo nature, and contrib AND/OR V-shape	prity of both banks rosion present on is. Vegetative at on 20-40% of fficient to prevent to 60-80% of the d by sediment. orary/transient in uting to instability, d channels have	vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious bank sk. Erosion/raw ban	najority of banks cut. Vegetative on less than 20% of	
	10% of I	bottom.	stream	s 10-40% of the bottom.	vegetative protecti banks and depositi contribute	ed channels have ion on > 40% of the ional features which to stability.		ks and stable ition is absent.	than 80% of stream deposition, contrib	n bed is covered by buting to instability. channels and/or	
Score	3	3	2	.4	:	2	1.0	6	1	1	
2. RIPARIAI	N BUFFERS: A	Assess both bank	Con	ditional Cate		ugh measuremen	ts of length & width	h may be accep	table)		
	Opti	imal	Subo	ptimal	Mar	ginal	Poo	or		,	
<b>.</b>	Tree stratum (dbh >		High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches)	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches)	High Marginal: Non-maintained,	Low Marginal: Non-maintained, dense herbaceous	High Poor: Lawns, mowed,		l A	{	
Riparian Buffers	with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		woods ballast/track	
Buffers	with > 60% tree ca non-maintained und located within the	anopy cover and a derstory. Wetlands	to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	FLOW	woods ballast/track	
Condition Scores  1. Delineate ripidescriptors. 2. Determine sobelow.	with > 60% tree ca non-maintained und located within the	anopy cover and a derstory. Wetlands er iparian areas.  5 each stream ban each by measuring the cover and the cove	to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C	30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  attegories and Congth and width. Congth and width. Congth and width. Congth attegories and Congth and width. Congth and width. Congth and width. Congth and width. Congth attegories and Congth and width. Congth and width. Congth and width. Congth attegories and Congth and width. Congth attended to the congth attended	vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		woods ballast/track	
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I	with > 60% tree co	anopy cover and a derstory. Wetlands derstory. Wetlands er iparian areas.  5  each stream ban each by measurin Score for each r 70% 1.2	to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition Cog or estimating legiparian category in 15%	30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  attegories and Congth and width. Congth and width. Congth blocks below	vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Rid	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  Le sums parian qual 100  100%	FLOW  Cl= (Sum % RA * S	cores*0.01)/2	
Condition Scores  1. Delineate rip: descriptors. 2. Determine scoelow. 3. Enter the % I	with > 60% tree co	anopy cover and a derstory. Wetlands er iparian areas.  5 each stream ban each by measurin Score for each r 70% 1.2	to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition Cog or estimating legiparian category in 15%	30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  attegories and Congth and width. Congth and width. Congth blocks below	vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Ri	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  Le sums  parian  qual 100	FLOW  Cl= (Sum % RA * S  Rt Bank Cl >	cores*0.01)/2 1.08	
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI	with > 60% tree co	anopy cover and a derstory. Wetlands derstory. Wetlands er iparian areas.  5 each stream ban each by measurin Score for each r 70% 1.2 100% 1.2 aried substrate si	to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating lest parian category in 15% 1.1	30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  ategories and Congth and width. (and the blocks below 15% 0.5	vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://www.nc.nop/cover.">https://www.nc.nop/cover.</a> High  0.85  Addition Scores us Calculators are present with <a href="https://www.nc.nop/cover.">https://www.nc.nop/cover.</a> ody and leafy det	riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % Ri  Blocks ec	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%	FLOW  Cl= (Sum % RA * S	cores*0.01)/2	
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	with > 60% free cc non-maintained und located within the  1. arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Score >  W HABITAT: Va root mats; SAV; ri	anopy cover and a derstory. Wetlands derstory. Wetlands er iparian areas.  5 each stream ban each by measurin Score for each r 70% 1.2 100% 1.2 aried substrate si	to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le iparian category in 15%  1.1	30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  ategories and Congth and width. (and the blocks below 0.5	vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are proved.	riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % Ri  Blocks ec	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Les sums parian qual 100  100%  100%	FLOW  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	cores*0.01)/2 1.08	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/ Available	with > 60% free connon-maintained und located within the located withi	anopy cover and a derstory. Wetlands derstory. Wetlands er iparian areas.  5 each stream ban each by measuring the stream ban from the stream ban areas.  100% 1.2 100% 1.2 aried substrate si iffle poole completimal	to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le iparian category in 15%  1.1  izes, water velocitexes, stable feature Subo Stable habitat ele present in 30-50%	30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  ategories and Congth and width. Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditional ptimal ments are typically 6 of the reach and	vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.10/">https://doi.org/10.10/</a> High  0.85  Calculators are provided and leafy det  all Category  Stable habitate present in 10-30  Stable habitate present in 10-30	riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you  ginal  ments are typically % of the reach and	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % Ri  Blocks ec	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	FLOW  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >  NOTES>>	cores*0.01)/2 1.08	
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	with > 60% tree cc non-maintained unc located within the located withi	anopy cover and a derstory. Wetlands derstory. Wetlands er iparian areas.  5  each stream ban each by measurin Score for each r 70% 1.2  100% 1.2  aried substrate si iffle poole comple imal imal re typically present.	to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating lest parian category in 15%  1.1  Zees, water velocitiexes, stable feature sees, stable feature sees of the present in 30-50g are adequate for popul	30% tree canopy cover and a maintained understory. Recent cutower (dense vegetation).  Low  1.1  ategories and Congth and width. (and the blocks below 0.5  y and depths; wores.  Conditional primal ments are typically	vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Andition Scores us Calculators are provided to the canopy cover.  I Category  Stable habitat ele present in 10-30% are adequate fo popul	riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks ection of the comparable condition.	Impervious Impervious Surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  Low  100%  100%  100%  100%	FLOW  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >  NOTES>>	cores*0.01)/2 1.08	1

	St	ream In	npact A	ssessm	ent For	m Page	2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2SB	02080105	12/17/2015	04-STR-32			
	_ ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, conc	rete, gabions, or	concrete blocks, s	straightening of ch	nannel, channeliza	ation,	NOTES>>		
			Conditiona	I Category						
	Negligible	Mir	nor	Mode	erate	Sev	ere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	is disrupted by any of the channel	Greater than 8t disrupted by any alterations listed i guidelines AND/O shored with gal cem	of the channel n the parameter R 80% of banks pion, riprap, or			CI
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5			1.50
	REACH C	ONDITION II	NDEX and S	TREAM CON	IDITION UN	ITS FOR TH	IS REACH			
NOTE: The CIs and R	CI should be rounded to 2 decimal places. T	he CR should be roun	ided to a whole number	er.			THE REACH (	CONDITION INI	DEX (RCI) >>	
					'		RC	I= (Sum of all C	il's)/5	
						·	COMPENSATI	ION REQUIREN	MENT (CR) >>	0
							CR = RC	I X LF X IF	•	

INSERT PHOTOS:

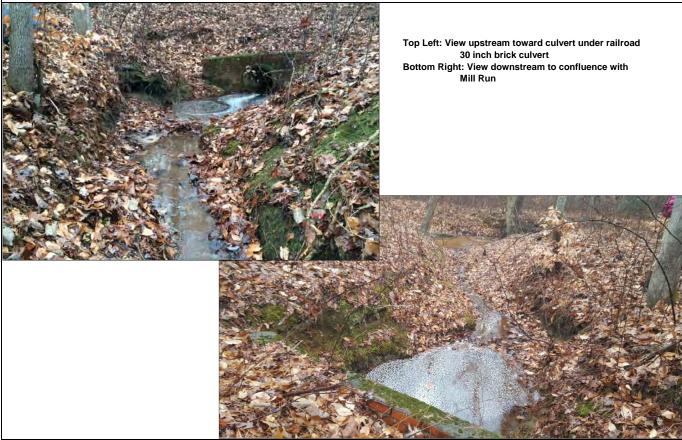
Top Left: Typical view of stream, facing upstream along railroad Botom Right: Typical view of stream, facing away from railroad



NC DWQ Stream Identification Form	Version 4.11	Mill Rur	04.	-STR-32
Date: 12/17/2015	Project/Site: DC	C2RVA - Area 04	Latitude: 37.96	60318
Evaluator: K. Astroth	County: Carolin	e County	Longitude: -77	7.424094
<b>Total Points:</b> 31.75 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle one) ermitten Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 14.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence		$\sim$		
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	$\bigcirc$	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 6.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?		0 = 0	Yes:	
C. Biology (Subtotal = 10.75)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	2	<u>.</u> 1	0
20. Macrobenthos (note diversity and abundance)		1	(2)	3
21. Aquatic Mollusks	Ő	1	2	3
22. Fish	$+ \circ$	0.5	(1)	1.5
23. Crayfish	0	0.5		1.5
-	0		1	
24. Amphibians		0.5	$-\underbrace{1}$	1.5
25. Algae	0	0.5 OF	1 1 0th a r	1.5
26. Wetland plants in streambed	da Casa 25 at manua		BL = 1.5 Other = 0	)
*perennial streams may also be identified using other method Notes: Field Sheet 12-A-STR-02 (Mill Run).	18. See p. 35 of manua	11.		
Notes: Fleid Sneet 12-A-STR-02 (Milli Ruff).				
W. C.		1	CECA FACILIE	
Sketch:	Open Woods		own tree	
ONGIOII.	FLO	W=>	_	
4		//		
1		7/		
- Jana		,		
incised bank/erosio	n			
	Open W	/oods		
	Ballast/Trac			

		Stre		fied Stream N	lethodology f	or use in Virg	ginia				
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	04	VA	R4SB	02080105	12/17/2015		lengin	1 actor	
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
	K. Astroth					04-S	ΓR-33				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream		ondition (erosion,						
	Opt	imal	Subo	ptimal		ginal	Po	or	Sev	ere	
	7	WA SHE		~		less than Severe or	Overwidend		1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or full) bankfull benches. and transverse ba	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, dfloodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe ewer bank slopes. seent on 40-60% of tative protection on Streambanks may creat. AND/OR 40- h is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the bed by sediment. orary/transient in outing to instability.	Deeply incised vertical/lateral in incision, flow cor banks. Streambe rooting depth, rr vertical/lunderc protection present danks, is not pre Obvious bank sl. Erosion/raw ban AND/OR Aggradin	stability. Severe tained within the do below average hajority of banks ut. Vegetative on less than 20% of venting erosion. Doughing present. ks on 80-100%.	
	sediment deposition 10% of	on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protection 40% of the bar	on is present on > iks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by outing to instability. channels and/or	С
Score	3	3	2	.4		2	1.	6	1		2.0
NOTES>>						12-A-STR-0					
	N BUFFERS: /		Con		gory				table)		
	Opti Tree stratum (dbh: with > 60% tree ca	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the	gory	ugh measuremen	ts of length & widt		,		
2. RIPARIAN Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cu. non-maintained un	imal  > 3 inches) present, anderstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	,		
2. RIPARIAN	Opti Tree stratum (dbh: with > 60% tree canon-maintained unlocated within th	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails other coringarable conditions.	,		
Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 2. Determine scorelow.	Opti Tree stratum (dbh: with > 60% tree canon-maintained unlocated within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Categories and Congth and width. Categories and Categori	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processed.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	,		
Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 2. Determine scorelow.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of t	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream bank each by measurin Score for each ries.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20%	an areas along the ditional Categories and Congth and width. Categories and Categori	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processed.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	,		
Riparian Buffers  Condition Scores  Delineate ripadescriptors. Delineate ripadescriptors. Enter the % I	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of t	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream bani each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	an areas along the ditional Categories and Congth and width. Categories and Categori	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processed.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	,	cores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate ripadescriptors. Delineate ripadescriptors. Enter the % I	Tree stratum (dbh: with > 60% tree canon-maintained unlocated within the  1. arian areas along uare footage for e Riparian Area and % Riparian Area> % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream baniesch by measurin Score for each ri 80% 1.2	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 1.1	an areas along the ditional Categories and Congth and width. Categories and Categori	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processed.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	1.18	CI
Condition Scores  1. Delineate ript Jescriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree canon-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream banisach by measurin Score for each ri 80% 1.2 80% 1.2 aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 1.1  20% 1.1	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Con the blocks below by and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with amaintained understory.  Low  0.75 sing the ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S		CI 1.1
Condition Scores  1. Delineate ript descriptors. 22. Determine scoelow. 33. Enter the % f Right Bank Left Bank 33. INSTREAL	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5.5  each stream bank each by measurin Score for each ri 80% 1.2  80% 1.2  aried substrate si iffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 1.1  20% 1.1  zes, water velocit exes, stable feature	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Coungth and width. Coungth and width. Coungth and width. Coungth and depths; wo res. Conditiona	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Acalculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tf  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >  Lt Bank CI >	1.18	
Condition Scores  L. Delimeate rips descriptors. Left Bank  Left Bank  Left Banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree canon-maintained unifocated within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream banisach by measurin Score for each ri 80% 1.2  80% 1.2  aried substrate si iffle poole complesimal	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 1.1  zes, water velocit exes, stable featur  Subo  Stable habitat elei	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Con the blocks below the blocks below the primal ments are typically ments are typically ments are typically ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt  of % R Blocks et  Blocks et  High  Deliver to the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, cor other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >  Lt Bank CI >	1.18	
Condition Scores  1. Delineate ripz descriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank 3. INSTREAI undercut banks; Instream	Tree stratum (dbh: with > 60% tree canon-maintained unifocated within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bank each by measurin Score for each ri 80% 1.2  80% 1.2  aried substrate si iffle poole completimal re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 20% 1.1  20% 1.1  zes, water velocit exes, stable featur  Subo  Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Categoriem al Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. Congth and width. Congth and depths; wo res. Conditionaptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory. Low  0.75  sing the ovided for you  pris; stable substr	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >  Lt Bank CI >	1.18	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point Project # Date SAR length Impact Factor R4SB 02080105 12/17/2015 04-STR-33 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by any of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. is disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has been guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not cement. guidelines. guidelines. recovered. recovered. CI SCORE 1.5 1.3 1.1 0.9 0.7 0.5 1.30 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF INSERT PHOTOS:



NC DWQ Stream Identification Form	Version 4.11	Mill Run	04-	-STR-33
Date: 12/17/2015	Project/Site: DO	C2RVA - Area 04	Latitude: 37.96	60242
Evaluator: K. Astroth	County: Carolin	ne County	Longitude: -77	.425205
<b>Total Points:</b> 19.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determine Ephemera Inte	ination (circle one) ermittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 8.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	9	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	( N	0 = 0	Yes :	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 5)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes :	= 3
C. Biology (Subtotal = 6			_	
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	9		2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish		0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	11	1.5
26. Wetland plants in streambed		FACW = 0.75; OBI	_ = 1.5 Other = 0	
*perennial streams may also be identified using other method				
Notes: Originates at culvert 1 and drains into STR	-2 (Mill Run). Fiel	d Sheet 12-A-STR-0	01.	
Sketch: Will Run	FLOW	ulvert 1		

	Ephemera	Uni	fied Stream N			Jiiia			
Project #	Project Name	•	For us	Cowardin	treams HUC	Date	SAR#	Impact/SAR	Impact
N/A	DC2RVA - Area		VA	Class. R6	02080105			length	Factor
	e(s) of Evaluator(s)		e and Informa	-	02000100				
	K. Astroth				04-S	ΓR-34			
RIPARIAN	N BUFFERS: Assess both bank		· ·	•	ugh measuremen	ts of length & wid	th may be accept		
	Optimal	,	ditional Cate		ginal	Po	oor	NOTES>> 12-STR-A1-2	
Riparian Buffers	Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		
Condition	4.5	High	Low	High	Low	High	Low		
Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5		
scriptors. Determine sq ow.	arian areas along each stream ban quare footage for each by measurir Riparian Area and Score for each r	g or estimating le	ngth and width. (	Calculators are pr	-	of % F	the sums Riparian equal 100		
Right Bank	% Riparian Area>						0%	-	
	Score >							CI= (Sum % RA * Sc	ores*0.01)/2
eft Bank	% Riparian Area>						0%	Rt Bank CI >	0.00
	Score >		NDEV and C					Lt Bank CI >	0.00
	ILE/IOII O		ないきょ さいのう	TREAM COL	NDITION UN	ITS FOR TH	IS REACH	•	
E: The CIs and R	RCI should be rounded to 2 decimal places.				NDITION UN	ITS FOR TH		CONDITION INDI	EX (RCI) >>
E: The CIs and R	RCI should be rounded to 2 decimal places.				NDITION UN		THE REACH (	CI= (Riparian CI)/	2
					NDITION UN		THE REACH ( R COMPENSATI		2
					NDITION UN		THE REACH ( R COMPENSATI	CI= (Riparian CI)/ ON REQUIREME	2
SERT PHO	DTOS:				NDITION UN		THE REACH ( R COMPENSATI	CI= (Riparian CI)/ ON REQUIREME	2
NSERT PHO					NDITION UN		THE REACH ( R COMPENSATI	CI= (Riparian CI)/ ON REQUIREME	2
NSERT PHO	DTOS:				NDITION UN		THE REACH ( R COMPENSATI	CI= (Riparian CI)/ ON REQUIREME	2

Project/Site: DC2RVA - Area 04

NC DWQ Stream Identification Form Version 4.11

Date:

04-STR-34

Latitude: 38.959603

Evaluator: K. Astroth	County: Carolin	ne County	Longitude: -7	7.4256
<b>Total Points:</b> 0 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name	:
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes	= 3
a artificial ditches are not rated; see discussions in manual	<u>'</u>	<u>,                                      </u>		
B. Hydrology (Subtotal =)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?		0.5	Yes	
C. Biology (Subtotal =)		0 – 0	100	
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	<u> </u>	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	<u> </u>	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	 1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB		
*perennial streams may also be identified using other meth	ods See n. 35 of manua		L = 1.5 Other =	<u> </u>
Notes: NC data for this resource not available (r			om GIS. No stre	am shown in
the National Hydrography Database.	,			
Sketch:				

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
Project #		Project Name		Locality	nels classified as Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	04	VA	R2SB	02080105	12/15/2015				
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation	24.05					
	K. Astroth					04-S	ΓR-35				
. Channel C	Condition: Asse	ess the cross-sec	tion of the stream		ondition (erosion, conditional Categor						
	Opti	imal	Subo	ptimal		ginal	Po	or	Sev	ere	
		WAR OF THE PERSON OF THE PERSO	Slightly incised for	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally			5	
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR urres contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient	or Poor due to lo Erosion may be pre both banks. Vegel 40-60% of banks. bevertical or unde 60% of stream sediment. Sec temporary/trans	wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Maju are near vertical. E 60-80% of banl protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	ority of both banks rosion present on cs. Vegetative at on 20-40% of ficent to prevent to 60-80% of the dby sediment. orary/transient in uting to instability.	Deeply incised vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sik Erosion/raw ban	stability. Severe tained within the do below average tajority of banks ut. Vegetative on less than 20% of venting erosion. Dughing present. ks on 80-100%.	
	sediment deposition 10% of	on covers less than bottom.	sediment cover	each. Transient is 10-40% of the bottom.	AND/OR V-shape vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protectic 40% of the ban sediment depos	on is present on > ks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by outing to instability. channels and/or	CI
Score	3	3	2	.4	2	2	1.	6	1		2.0
. RIPARIAI	N BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (rou	ugh measuremen	ts of length & widt	h may be accep	table)		
. RIPARIAI	Opti	imal	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches)	ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches)	Mare High Marginal: Non-maintained, dense herbaceous	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland;	Low Poor: Impervious surfaces, mine	notes>>		
Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with <a href="https://doi.org/10.100/j.nc/9/">30 inches) present, with</a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a>	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
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Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % I	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % I	Tree stratum (dbh with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream bani each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>		
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow.	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream banicach by measurin Score for each ri 80% 1.6	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 1.1	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums imparian qual 100 100%	NOTES>>  CI= (Sum % RA * S		CI
Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % I	Tree stratum (dbh a with > 60% tree conon-maintained una located within the located withi	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream band each by measurin Score for each rise.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in 20%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>	cores*0.01)/2 1.50 1.03	CI 1.27
Riparian Buffers  Condition Scores  Delineate ripescriptors Determine scelow Enter the % I	Tree stratum (dbh : with > 60% tree cc on non-maintained und located within the located w	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream baniesch by measurin Score for each ri 80% 1.6  60% 1.2  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 1.1  10% 0.85  zes, water velocit	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies the seeded and stabilized area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	1.50	
Riparian Buffers  Condition Scores  Delineate riprescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAI	Tree stratum (dbh : with > 60% tree ca non-maintained un located within th located within th located within th strain areas along quare footage for e Riparian Area and % Riparian Area > Score > M HABITAT: Varoot mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bank each by measurin Score for each ri 80% 1.6  60% 1.2  aried substrate si iffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 1.1  10% 0.85  zes, water velocit exes, stable feature	ditional Categoritimal  Low Suboptimal: Riparian areas with tree stratum (dbh 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Coungth and width. Coungth and width. Coungth and width. Coungth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the control of the con	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, conditions.  Low 0.5  Low 10.5   NOTES>>  CI≕ (Sum % RA * S  Rt Bank CI >  Lt Bank CI >	1.50		
Riparian Buffers  Condition Scores  Delineate rip: escriptors. Determine scelow. Enter the % I Right Bank  Left Bank  Instream Habitat/	Tree stratum (dbh : with > 60% tree cc on non-maintained und located within the located w	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream banicach by measurin Score for each ri 80% 1.6  60% 1.2  aried substrate si iffle poole complesimal	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 20% 1.1  10% 0.85  zes, water velocit exes, stable featur  Subo  Stable habitat elei	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the second of the second	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks existed and stabiliz	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%	NOTES>>  CI≕ (Sum % RA * S  Rt Bank CI >  Lt Bank CI >	1.50	
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % I Right Bank  Left Bank B. INSTREAI ndercut banks; Instream	Tree stratum (dbh : with > 60% tree cc on non-maintained und located within the located w	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream banke ach by measurin Score for each ri 80% 1.6 60% 1.2 aried substrate si iffle poole completimal re typically present	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating leeparian category in 20% 1.1  10% 0.85  zes, water velocitixes, stable features suboptimes su	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal  ments are typically 6 of the reach and rmaintenance of	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed  atte; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  100%  100%  100%	NOTES>>  CI≕ (Sum % RA * S  Rt Bank CI >  Lt Bank CI >	1.50	

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	csx		VA	R2SB	02080105	12/15/2015	04-STR-35		
	ALTERATION: Stream cross poil piles, constrictions, livestock	sings, riprap, conc			straightening of ch	hannel, channeliz	ation,	NOTES>>	
	Negligible	Mir	Conditiona nor		erate	Sev	ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with ga cem	of the channel in the parameter PR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5		
	REACH C	ONDITION II	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

### INSERT PHOTOS:



NC DWQ Stream Identification Form Version 4.11

Date: 12/15/2015	Project/Site: DC2RVA - Area 04	Latitude: 37.959345
Evaluator: K. Astroth	County: Caroline County	Longitude: -77.427921
<b>Total Points:</b> 30 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 14)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	1	2	(3)
3. In-channel structure: ex. riffle-pool, step-pool,	0		2	3
ripple-pool sequence	U		2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 7				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 9)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method	s. See p. 35 of manua	al.		
Notes: Drainage ditch that originates from Cul2. D	rains into WTL 14	I. Field Sheet 12	-A-STR-01.	
-				
	FLOW =	^	114	
Sketch:	1,500,00			
		-/	10 to 1	
		11	access road ballast	
		17	Sala	
		V	8 5	
		culvert-	18	
		J. 50 Care 10 70 70 10 10 10 10 10 10 10 10 10 10 10 10 10	1111	

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Impact Cowardin Project # **Project Name** Locality HUC Date SAR# Class length **Factor** 08/29/2016 N/A DC2RVA VΑ R6 02080105 Stream Name and Information Name(s) of Evaluator(s) 04-STR-36 L. Eggering, L. Postaski 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Optimal Channel flows through Suboptimal Marginal Poor a culvert under the Low Marginal: Non High Poor: ow Suboptima High Suboptimal Riparian areas with tree stratum maintained, dense High Marginal: Non-maintained, lense herbaceou Riparian areas with tree stratum CSX railway. Riparian and maintained Low Poor area is mixed Impervious egetation, riparia areas, nurseries (dbh > 3 inches) areas lacking shrub and tree stratum, hay production, (dbh > 3 inches) no-till cropland; surfaces, mine vegetation with either a shrub layer or a tree present, with hardwood forest. ree stratum (dbh > 3 inches) present with > 60% tree canopy cover and an non-maintained understory. Wetlands esent, with 30% to 60% tree actively grazed pasture, sparsely spoil lands. Riparian 30% tree canop Original Field Sheet: cover and a **Buffers** canopy cover and containing both herbaceous and shrub layers or a onds, open water vegetated nonrow crops, active maintained layer (dbh > 3 12-A-STR-01. If present, tree stratum (dbh >3 areas maintained area feed lots, trails, or understory. Recent cutover (dense nches) present with <30% tree recently seeded and stabilized, or other comparable conditions. ches) present, wit canopy cover non-maintained <30% tree canopy ther comparable vegetation). understory cover with condition. understory High Low High High Low Condition 0.85 0.75 0.6 0.5 1.2 1.1 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums escriptors Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% % Riparian Area> Right Bank 1.1 CI= (Sum % RA \* Scores\*0.01)/2 100% 100% CI % Riparian Area> Rt Bank CI > 1.10

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2

Lt Bank CI >

1.10

1.10

0.55

0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

**INSERT PHOTOS:** 

Left Bank

Score >

1.1



Project/Site: DC2RVA

NC DWQ Stream Identification Form Version 4.11

Date: 08/29/2016

04-STR-36

Latitude: 37.958346

No =	Weak  1  1  1  1  1  1  1  1  1  1  1  1  1	## e.g. Quad Name:    Moderate	Strong  3 3 3 3 3 3 3 1.5 1.5
No =	1 1 1 1 1 1 1 0.5 0.5	2 2 2 2 2 2 2 2 1 1 1 Yes =	3 3 3 3 3 3 3 3 1.5 1.5 1.5 1.5
No =	1 1 1 1 1 1 1 0.5 0.5	2 2 2 2 2 2 2 2 1 1 1 Yes =	3 3 3 3 3 3 3 3 1.5 1.5 1.5 1.5
No =	1 1 1 1 1 1 0.5 0.5 0.5	2 2 2 2 2 2 1 1 1 Yes:	3 3 3 3 3 3 1.5 1.5 1.5 1.5
No =	1 1 1 1 1 0.5 0.5 0.5	2 2 2 2 2 2 1 1 1 Yes:	3 3 3 3 3 1.5 1.5 = 3
No =	1 1 0.5 0.5 0.5	2 2 2 2 2 1 1 Yes:	3 3 3 3 1.5 1.5 = 3
No =	1 1 0.5 0.5 0.5	2 2 2 2 1 1 1 Yes =	3 3 3 1.5 1.5 = 3
No =	1 1 0.5 0.5 0.5	2 2 1 1 Yes:	3 3 1.5 1.5 = 3
No =	1 1 0.5 0.5 0.5 1 1 0.5	2 2 1 1 Yes:	3 3 1.5 1.5 = 3
No =	1 0.5 0.5 1 1 0.5	2 1 1 Yes:	3 1.5 1.5 = 3 3 3 0
No =	0.5 0.5 1 1 0.5	1 1 Yes:	1.5 1.5 = 3 3 3 0
No =	1 1 0.5	2 2 0.5	1.5 = 3 3 3 0
	1 1 0.5	2 2 0.5	3 3 0
	1 1 0.5	2 2 0.5 1	3 3 0
	0.5	2 0.5 1	3 0
	0.5	2 0.5 1	3 0
	0.5	2 0.5 1	3 0
	0.5	0.5 1	0
	0.5	1	
			1.5
	0.5		4 -
	0	1	1.5
No =		Yes:	= 3
<u> </u>	0		
$\longleftarrow$	2	1	0
2	2	1	0
	1	2	3
)	1	2	3
	0.5	1	1.5
	0.5	1	1.5
)			1.5
<u> </u>			1.5
	FACW = 0.75; C	OBL = 1.5 Other = 0	
f manual.			
Hard	hiood		
	of manual.	0.5 0.5 FACW = 0.75; 0	0.5 1 0.5 1 FACW = 0.75; OBL = 1.5 Other = 0

Stre		Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia For use in wadeable channels classified as intermittent or perennial											
Project #		Project Name		Project Name		wadeable chan	nels classified a Cowardin	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact	
		•		•	Class.			JAN#	length	Factor			
N/A Name	e(s) of Evaluat	tor(s)		VA e and Informa	R4SB	02080105	12/14/2015						
Hain	K. Astroth	101(0)	Otrouii Ruii	o una miorni		04-S	ΓR-37						
. Channel C	Condition: Asse	ess the cross-sec	tion of the stream	n and prevailing co	ondition (erosion,								
	Opti			onditional Catego	ry ginal	Po	or	Sev	vere				
	T J	L JANA	1	ير.		less than Severe or	Overwiden		1	5			
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-10 Stable point bars/l are present. Acce floodplain or fully bankfull benches. and transverse ba sediment depositio	n or natural rock, 00%). AND/OR bankfull benches ses to their original of developed wide Mid-channel bars, ars few. Transient	erosion or unprote of banks are s Vegetative protec prominent (60 Depositional feat stability. The bar channels are we likely has access t or newly develope portions of the r	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient	or Poor due to lo Erosion may be pn both banks. Vege: 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran instability. Depositio stability, may be	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is inst. erosion. AND/OI stream is cover Sediment is temp nature, and contril AND/OR V-shapp	ority of both banks crosion present on ks. Vegetative to 20-40% of fficient to prevent R 60-80% of the dby sediment. orary/transient in buting to instability. dc channels have	roting depth, r vertical/underc rooting depth, r vertical/underc protection present of banks, is not pre Obvious bank sla Erosion/raw ban	stability. Severe tatained within the ed below average najority of banks sut. Vegetative on less than 20% of eventing erosion.			
	10% of I	bottom.		rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depor	iks and stable	than 80% of stream deposition, contrib Multiple thread subterran	channels and/or	(		
Score	3	3	2	.4	:	2	1.	6	1	I	2		
. RIPARIAN	N BUFFERS: A	Assess both bank	's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	h may be accep					
2. RIPARIAN	N BUFFERS: A		Con	ditional Categ ptimal	gory	ginal  Low Marginal:	ts of length & wid		table)				
Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con	ditional Cate	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po						
Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree canon-maintained unc	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and containing both herbaceeus and shrub layers or a	ditional Categorium I  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable					
Riparian	Opti  Tree stratum (dbh > with > 60% tree canon-maintained unc	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh 2 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.					
Riparian Buffers  Condition Scores  Delineate ripalescriptors. Determine squelelow.	Opti Tree stratum (dbh > with > 60% tree ca	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream baniach by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 300 present, with 300 to 60% tree canopy cover and containing both herbaceous and shroth layers or a hroth layers herbaceous and shroth layers herbaceo	ditional Categorian Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.					
Riparian Buffers  Condition Scores  Delineate ripalescriptors. Determine squelelow.	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5.5  each stream bank each by measurin Score for each ri	High Suboptimal: Riparian areas with tree stratum (dbh 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Interpretation of the condition itional Categorian Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.						
Riparian Buffers  Condition Scores  Delineate rips Jescriptors. Determine squelow.	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5.5  each stream bank each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and herbaceous and shrub layers or a non-maintained understory.  High 1.2  Linto Condition C g or estimating le parian category in	ditional Categorian Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100		cores*0.01)/2			
Condition Scores  Delineate ripelescriptors. Determine squelow. Enter the % F	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bani each by measurin Score for each ri 80% 1.1	High Suboptimal: Riparian areas With tree stratum (dbh - 3 inches) to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating le parian category it 20% 1.5	ditional Categorian Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100	NOTES>>	1.18	(		
Riparian Buffers  Condition Scores  Delineate ripalescriptors. Determine squelow. Enter the % F Right Bank	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bani each by measurin Score for each ri 80% 1.1	High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Into Condition Co go restimating le parian category is 20% 1.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are proven.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, traits, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S		<u>(</u>		
Riparian Buffers  Condition Scores  Delineate ripe lescriptors. Determine squelow. Right Bank  Left Bank  B. INSTREAN	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bani each by measurin Score for each ri 80% 1.1  80% 1.1  aried substrate si	High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) to 80% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating le parian category it 20% 1.5  20% 1.5  zes, water velocit	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Accident Scores us Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, traits, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.18			
Riparian Buffers  Condition Scores  Delineate ripalescriptors. Determine squelow. Right Bank  Left Bank  Left Bank  Instream	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bank each by measurin Score for each ri 80% 1.1  80% 1.1  aried substrate si iffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Cinto Condition C g or estimating le parian category in 20%  1.5  20%  1.5  zes, water velocit xes, stable featu	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. (	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are prov.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.18			
Riparian Buffers  Condition Scores  Delineate ripa elescriptors. Determine squelow. Enter the % F Right Bank  Left Bank  Left Bank  INSTREAN	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream bankeach by measurin 80% 1.1 80% 1.1 aried substrate si iffle poole completimal re typically present	High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and containing both herbaceous and containing both herbaceous and containing both herbaceous and containing both herbaceous and containing both herbaceous and containing both herbaceous and understory.  High 1.2  cinto Condition Co g or estimating le parian category in 20% 1.5  20% 1.5  20% Stable habitat ele present in 30-50% are adequate for	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are prov.  I Category  Mar.  Stable habitat ele present in 10-30% are adequate for are proved and are proved and are present in 10-30% are adequate for a for a	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t     of % R     Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, traits, or other comparable conditions.  Low 0.5  Low 10.5   NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >  NOTES>>	1.18				

	St	ream In	pact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	/A CSX VA R4SB					12/14/2015	04-STR-37		
	L ALTERATION: Stream cross poil piles, constrictions, livestock		Conditiona	I Category				NOTES>> Channelize	ed
	Negligible	Mir	nor	Mod	erate	Sev	ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with gal cem	y of the channel in the parameter OR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5	1	
	REACH C	ONDITION IN	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH		
OTE: The Cls and R	RCI should be rounded to 2 decimal places. T	The CR should be roun	ded to a whole number	er.			THE REACH	CONDITION INI	DEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

#### INSERT PHOTOS:



Project/Site: DC2RVA - Area 04

NC DWQ Stream Identification Form Version 4.11

Date: 12/14/2015

04-STR-37

Latitude: 37.958114

County: Caroline	e County	Langituda, 77	
_		Longitude//	.433316
Stream Determine Ephemeral (nter	nation (circle one) mittent erennial	Other e.g. Quad Name:	
Absent	Weak	Moderate	Strong
0	1	2	3
0	1	(2)	3
0	1	2	3
0	(1)	2	3
0	1	2	3
(0)	1	2	3
0		2	3
0	1	2	3
0	0.5	1	1.5
0	0.5	1	1.5
No	= 0	Yes =	= 3
0	1		3
0	1	<b>(2)</b>	3
1.5	1	0.5	0
0	0.5	1	1.5
	0.5	1	1.5
( No	= 0	Yes =	= 3
3	2	(1)	0
(3)	2	1	0
7	(1)	2	3
0	1	2	3
	0.5	1	1.5
0	0.5	1	1.5
0	0.5	1	1.5
0	0.5	1	1.5
	FACW = 0.75; OB	L = 1.5 Other = 0	
See p. 35 of manual			
l. Field Sheet 12-	A-STR-04.		
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	0 1 2 0 1 2 0 0 1 2 0 0 1 2 0 0 1 2 0 0 1 2 0 0 1 2 0 0 1 2 0 0 0.5 1 0 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Strea		Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia For use in wadeable channels classified as intermittent or perennial									
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	04	VA	R4SB	02080105	12/14/2015		lengui	1 actor	
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation	l.	L				
	K. Astroth			04-ST			TR-38				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream	n of the stream and prevailing condition (erosion, aggradation)  Conditional Category							
	Opt	imal	Subo	ptimal		ginal	Po	or	Sev	ere	
	7	WA SHA				less than Severe or	Overwidend		1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	on or natural rock, 100%). AND/OR /bankfull benches es to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	ew areas of active cted banks. Majority table (60-80%), tion or natural rock-80%), AND/OR urres contribute to nkfull and low flow II defined. Stream o bankfull benches, of floodplains along each. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe were bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the bed by sediment. orary/transient in outing to instability.	Deeply incised vertical/lateral ininicision, flow con banks. Streambe rooting depth, m vertical/lunderc protection present c banks, is not pre Obvious bank sit. Erosion/raw ban AND/OR Aggrading	stability. Severe tained within the do below average apority of banks ut. Vegetative in less than 20% of venting erosion. bughing present. ks on 80-100%.	
	sediment deposition 10% of	on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the bar	on is present on > iks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	С
Score	3	3	2	.4		2	1.	6	1		2.0
NOTES>>				eld Sheet 1							
	N BUFFERS: /	Assess both bank	c's 100 foot riparia		e entire SAR. (roo			h may be accep	table)		
	Opti Tree stratum (dbh: with > 60% tree ca	imal  > 3 inches) present, anderstory. Wetlands	c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep			
2. RIPARIAI Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cr. non-maintained un	imal  > 3 inches) present, anderstory. Wetlands	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or			
2. RIPARIAI	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anderstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ripanian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of t	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream bant each by measurin score for each ries.	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, radiative stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1. arian areas along	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, radiative stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>		
Riparian Buffers  Condition Scores 1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bani each by measurin Score for each ri 15% 1.2	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 60% 1.1	to a reas along the ditional Categories and Congth and width.  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 25% 0.6	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, radiative stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, conditions.  Low 0.5  Low 0.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si		כו
Riparian Buffers  Condition Scores 1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bank each by measurin Score for each ri	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 60%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, radiative stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	NOTES>>	cores*0.01)/2 0.99 1.15	CI 1.0
Condition Scores  1. Delineate rip Jescriptors. 2. Determine scoelow. 3. Enter the % Right Bank Left Bank 3. INSTREAL	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin  Score for each ri  15%  1.2  65%  1.2  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 60% 1.1  20% 1.1  zes, water velocit	to a reas along the ditional Categories and County Recent cutover (dense vegetation).  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and County Additional County Recent Cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are province.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel folist, trails, or other comparable conditions.  Low 0.5  Low 10.5   NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	0.99		
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % Right Bank Left Bank 3. INSTREAL	Tree stratum (dbh: with > 60% tree ca non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Score >  W HABITAT: Va root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5  each stream bank each by measurin  Score for each ri  15%  1.2  65%  1.2  aried substrate si iffle poole comple	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 60% 1.1  20% 1.1  zes, water velocit exes, stable features	to a reas along the ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Coungth and width. Coungth and width. Coungth and width. Coungth and width. Coungth and width. Coungth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided to the condition of the condition	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (bdh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 1005  Low 1009  1109%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.99	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the % I Right Bank  Left Bank  Left Bank  Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree conon-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> core >  M HABITAT: Wood mats; SAV; r  Opti Habitat elements a	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bank each by measurin Score for each ri 15% 1.2  65% 1.2  aried substrate si iffle poole completimal are typically present	Con Subop High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 60% 1.1  20% 1.1  zes, water velocit exes, stable featur Subop Stable habitate lepresent in 30-50%	to a reas along the ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditional ptimal  ments are typically 6 of the reach and	High Marginal: Non-maintained, dense herbaceus wegetation ewith either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the canopy cover.  All Category  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (bdh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you  ginal  ments are typically % of the reach and	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en  Blocks en  Habitat elements lacking or are ur	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  110%  110%  Issted above are stable. Habitat	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.99	
Condition Scores Determine scoeledw. Senter the % I Right Bank  Left Bank  INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cz non-maintained un- located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Vi root mats; SAV; r  Opti  Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bank each by measurin Score for each ri 15% 1.2  65% 1.2  aried substrate si iffle poole completimal are typically present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 60% 1.1  20% 1.1  zes, water velocit exes, stable featur Subo Stable habitat ele present in 30-50% are adequate fo	to a reas along the ditional Categories and Council Categories and Catego	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ripanian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks et  Blocks et  High  Deliver the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 1005  Low 1006  Low 1007	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.99	

	64	room In	anaat A	00000	ont For	m Dog	- 2			
Project #	Applicant	ream m	Locality	Cowardin Class.	nent For	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R4SB	02080105	12/14/2015		SAK length	impact Factor	
	L ALTERATION: Stream cross	singe rinran conc						NOTES>>		
embankments,	spoil piles, constrictions, livestock	sings, riprap, conc			straigntering or ci	namei, chamieiz	Lation,	NOTEO		
	Negligible	Mi	nor	al Category Mod	erate	Sev	vere .			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any o the channel alterations listed in the parameter guidelines.	of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander	Greater than 8 disrupted by an alterations listed guidelines AND/0 shored with ga	30% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or tent.			
				pattern has not recovered.	pattern has not recovered.					CI
SCORE	1.5	1.3	1.1	0.9	0.7		.5			0.70
					NDITION UN					
NOTE: The CIs and	RCI should be rounded to 2 decimal places.	The CR should be roun	nded to a whole numb	er.				CONDITION IN I= (Sum of all C		
							COMPENSATI	ON REQUIRE		0
INSERT PHO							CR = RC	I X LF X IF		İ
DESCRIBE	PROPOSED IMPACT:						•	ew downstrea culvert unde nt: Typical vie away from ra	r railroad ew upstream,	

NC DWQ Stream Identification Form Version 4.11

04-STR-38

Tic Dir Q Stream Identification For	11 7 C1 S1011 7.11	
Date: 12/14/2015	Project/Site: DC2RVA - Area 04	Latitude: 37.950079
Evaluator: K. Astroth	County: Caroline County	Longitude: -77.442468
Total Points: 21 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:
A. Geomorphology (Subtotal = 9.5	Absent Weak	Moderate Strong

0	4		
	1	2	3
0	1	(2)	3
0	1	2	3
0	<b>(</b> 1)	2	3
0	1	(2)	3
(0)	1	2	3
0	(1)	2	3
0	1	2	3
0	0.5		1.5
0	0.5	1	1.5
No	o = 0	Yes:	= 3
		1	
0	1	(2)	3
0	1	(2)	3
1.5	1	0.5	0
0	0.5	1	1.5
0	0.5	1	1.5
No	0 = 0	Yes :	= 3
		_	
3	2	(1)	0
(3)	2	1	0
9	(1)	2	3
0	1	2	3
8	0.5	1	1.5
(0)	0.5	1	1.5
0	0.5	(1)	1.5
0	0.5	1	1.5
	FACW = 0.75;	OBL = 1.5 Other = 0	
See p. 35 of manua	al.		
ind outside of st	udy area and be	comes braided. Fie	ld Sheet
A fio	ws erground		
access road	FLOW	nnel begins again	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 0.5 0 0.	0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 0 5 1 0 0.5 1 0 0 0.5 1 0

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Impact Cowardin Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 04 02080105 N/A Name(s) of Evaluator(s) Stream Name and Information 04-STR-39 K. Astroth 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Low Marginal: Non-maintained, High Poor: Lawns, mowed ligh Suboptima High Marginal: Riparian areas ense herbaceou and maintained Riparian areas Low Poor: vegetation, riparian areas with tree stratum Non-maintained with tree stratum (dbh > 3 inches) areas, nurseries Impervious surfaces, mine (dbh > 3 inches) present, with ense herhaceou no-till cropland vegetation with either a shrub acking shrub and Tree stratum (dbh > 3 inches) presen spoil lands, resent, with 30% to 60% tree actively grazed Riparian 30% tree canon tree stratum, hav pasture, sparsely vegetated non-maintained area, with > 60% tree canopy cover and ar enuded surface cover and a maintained roduction, ponds open water. If laver or a tree canopy cover an containing both row crops, active eed lots, trails, or **Buffers** on-maintained understory. Wetland layer (dbh > 3 inches) present, understory present, tree herbaceous and recently seeded ther comparable Recent cutove with <30% tree stratum (dbh >3 shrub layers or a non-maintained and stabilized, o conditions. (dense vegetation). canopy cover. inches) present with <30% tree her comparable condition. understory canopy cover with maintained High High High Low Low Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> Right Bank Score > CI= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> 0% Rt Bank CI > 0.00 CI Left Bank Lt Bank CI > 0.00 0.00 Score > REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number THE REACH CONDITION INDEX (RCI) >> 0.00

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

INSERT PHOTOS:



Left: Typical view of stream Right: Typical view of stream

Project/Site: DC2RVA - Area 04

NC DWQ Stream Identification Form Version 4.11

Date:

04-STR-39

Latitude: 38.941

A. Geomorphology (Subtotal =	A. Geomorphology (Subtotal =   Absent   Weak   Moderate   Stroin	Evaluator: K. Astroth	County: Carolin	ne County	Longitude: -77	7.445819
1   Continuity of channel bed and bank	1° Continuity of channel bed and bank					
1° Continuity of channel bed and bank	1° Continuity of channel bed and bank       0       1       2       3         2. Sinuosity of channel along thalweg       0       1       2       3         3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence       0       1       2       3         4. Particle size of stream substrate       0       1       2       3         6. Depositional bars or benches       0       1       2       3         6. Depositional bars or benches       0       1       2       3         7. Recent alluvial deposits       0       1       2       3         8. Headcuts       0       1       2       3         9. Grade control       0       0.5       1       1.5         10. Natural valley       0       0.5       1       1.5         11. Second or greater order channel       No = 0       Yes = 3         3 artificial ditches are not rated; see discussions in manual       No = 0       Yes = 3         8. Hydrology (Subtotal =	A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence 4. Particles size of stream substrate 5. Active/relict floodplain 6. Depositional bars or benches 7. Recent alluvial deposits 7. Recent alluvial deposits 8. Headcuts 9. Grade control 10. Natural valley 11. Second or greater order channel 11. Second or greater order channel 11. Second or greater order channel 12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 15. Sediment on plants or debris 16. Organic debris discussions of high water table? 17. Soil-based evidence of high water table? 18. Fibrous roots in streambed 19. Rooted upland plants in streambed 20. Macrobenthos (note diversity and abundance) 21. Fish 22. Fish 23. Crayfish 24. Amphibians 25. Other = 0  FACW = 0.75; OBL = 1.5 Other = 0  Prepernial streams may also be identified using other methods. See p. 35 of manual.  Notes: NC data for this resource not available (no field sheets). Field Sheet filled out from GIS and photos. No	3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence 4. Particle size of stream substrate 5. Active/relict floodplain 6. Depositional bars or benches 7. Recent alluvial deposits 8. Headcuts 9. Grade control 10. Natural valley 10. No = 0 11. 2 3 15. Active/relict floodplain 10. 1 2 3 16. Depositional bars or benches 10. 1 2 3 17. Recent alluvial deposits 10. Natural valley 10. No = 0 11. 2 3 18. Headcuts 10. Natural valley 10. O. 0.5 1 1 1.5 11. Second or greater order channel 11. Second or greater order channel 12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 15. 1 0. So 1 2 3 18. Hydrology (Subtotal = 1.5 19. Sediment on plants or debris 10. Sediment on plants or debris 10. O. 0.5 1 1 1.5 11. Second or greater order channel 11. Second or greater order channel 12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 15. 1 0.5 0 15. Sediment on plants or debris 16. Organic debris lines or piles 17. Soil-based evidence of high water table? 18. Fibrous roots in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 10. O. 0.5 1 0.0 11. Second or greater order channel 19. Rooted upland plants in streambed 10. O. 0.5 1 0.0 11. Second or greater order channel 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in streambed 19. Rooted upland plants in st		0	1	2	3
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6. Depositional bars or benches       0       1       2       3         7. Recent alluvial deposits       0       1       2       3         8. Headcuts       0       1       2       3         9. Grade control       0       0.5       1       1         10. Natural valley       0       0.5       1       1         11. Second or greater order channel       No = 0       Yes = 3         *artificial ditches are not rated; see discussions in manual       B. Hydrology (Subtotal =)         12. Presence of Baseflow       0       1       2       3         13. Iron oxidizing bacteria       0       1       2       3         14. Leaf litter       1.5       1       0.5       0         15. Sediment on plants or debris       0       0.5       1       1         16. Organic debris lines or piles       0       0.5       1       1         17. Soil-based evidence of high water table?       No = 0       Yes = 3         C. Biology (Subtotal =)       1       2       1         18. Fibrous roots in streambed       3       2       1       0         19. Rooted upland plants in streambed       3       2       1       0	6. Depositional bars or benches         0         1         2         3           7. Recent alluvial deposits         0         1         2         3           8. Headcuts         0         1         2         3           9. Grade control         0         0.5         1         1.5           10. Natural valley         0         0.5         1         1.5           11. Second or greater order channel         No = 0         Yes = 3           8 artificial ditches are not rated; see discussions in manual         No = 0         Yes = 3           8. Hydrology (Subtotal =)		0	1	2	3
7. Recent alluvial deposits         0         1         2         3           8. Headcuts         0         1         2         3           9. Grade control         0         0.5         1         1           10. Natural valley         0         0.5         1         1           11. Second or greater order channel         No = 0         Yes = 3           artificial ditches are not rated; see discussions in manual         B. Hydrology         (Subtotal =	7. Recent alluvial deposits         0         1         2         3           8. Headcuts         0         1         2         3           9. Grade control         0         0.5         1         1.5           10. Natural valley         0         0.5         1         1.5           11. Second or greater order channel         No = 0         Yes = 3           **artificial ditches are not rated; see discussions in manual         **B. Hydrology (Subtotal =)           12. Presence of Baseflow         0         1         2         3           13. Iron oxidizing bacteria         0         1         2         3           14. Leaf litter         1.5         1         0.5         0           15. Sediment on plants or debris         0         0.5         1         1.5           16. Organic debris lines or piles         0         0.5         1         1.5           17. Soil-based evidence of high water table?         No = 0         Yes = 3           C. Biology (Subtotal =)	5. Active/relict floodplain	0	1	2	3
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8. Headcuts	8. Headcuts 0 1 2 3 9. Grade control 0 0 0.5 1 1 1.5 10. Natural valley 0 0.5 1 1 1.5 11. Second or greater order channel No = 0 Yes = 3  **artificial ditches are not rated; see discussions in manual**  B. Hydrology (Subtotal =	7. Recent alluvial deposits	0	1	2	3
10. Natural valley	10. Natural valley 0 0.5 1 1.5.5 1.5 1.5 1.5 2.5 3 1.5 3 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5		0	1	2	3
10. Natural valley	10. Natural valley 0 0.5 1 1.5.5 1.5 1.5 1.5 2.5 3 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5	9. Grade control	0	0.5		1.5
11. Second or greater order channel       No = 0       Yes = 3         a artificial ditches are not rated; see discussions in manual       B. Hydrology (Subtotal =	11. Second or greater order channel   No = 0   Yes = 3     artificial ditches are not rated; see discussions in manual     B. Hydrology (Subtotal =)   12. Presence of Baseflow   0   1   2   3     13. Iron oxidizing bacteria   0   1   2   3     14. Leaf litter   1.5   1   0.5   0     15. Sediment on plants or debris   0   0.5   1   1.5     16. Organic debris lines or piles   0   0.5   1   1.5     17. Soil-based evidence of high water table?   No = 0   Yes = 3     C. Biology (Subtotal =)   18. Fibrous roots in streambed   3   2   1   0     19. Rooted upland plants in streambed   3   2   1   0     19. Rooted upland plants in streambed   3   2   1   0     10. Macrobenthos (note diversity and abundance)   0   1   2   3     21. Aquatic Mollusks   0   1   2   3     22. Fish   0   0.5   1   1.5     23. Crayfish   0   0.5   1   1.5     24. Amphibians   0   0.5   1   1.5     25. Algae   0   0.5   1   1.5     26. Wetland plants in streambed   FACW = 0.75; OBL = 1.5 Other = 0    **perennial streams may also be identified using other methods. See p. 35 of manual.  Notes: NC data for this resource not available (no field sheets). Field Sheet filled out from GIS and photos. No st shown in the National Hydrography Database.					1.5
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14. Leaf litter       1.5       1       0.5       0         15. Sediment on plants or debris       0       0.5       1       1         16. Organic debris lines or piles       0       0.5       1       1         17. Soil-based evidence of high water table?       No = 0       Yes = 3         C. Biology (Subtotal =)	14. Leaf litter       1.5       1       0.5       0         15. Sediment on plants or debris       0       0.5       1       1.5         16. Organic debris lines or piles       0       0.5       1       1.5         17. Soil-based evidence of high water table?       No = 0       Yes = 3         18. Fibrous roots in streambed       3       2       1       0         19. Rooted upland plants in streambed       3       2       1       0         20. Macrobenthos (note diversity and abundance)       0       1       2       3         21. Aquatic Mollusks       0       1       2       3         22. Fish       0       0.5       1       1.5         23. Crayfish       0       0.5       1       1.5         24. Amphibians       0       0.5       1       1.5         25. Algae       0       0.5       1       1.5         26. Wetland plants in streambed       FACW = 0.75; OBL = 1.5 Other = 0       *perennial streams may also be identified using other methods. See p. 35 of manual.         Notes: NC data for this resource not available (no field sheets). Field Sheet filled out from GIS and photos. No standard resource not available (no field sheets). Field Sheet filled out from GIS and photos. No standard resource not available (no field sheets)	13. Iron oxidizing bacteria	0	1	2	3
15. Sediment on plants or debris       0       0.5       1       1.         16. Organic debris lines or piles       0       0.5       1       1.         17. Soil-based evidence of high water table?       No = 0       Yes = 3         C. Biology (Subtotal =)	15. Sediment on plants or debris 0 0.5 1 1.5  16. Organic debris lines or piles 0 0.5 1 1.5  17. Soil-based evidence of high water table? No = 0 Yes = 3  C. Biology (Subtotal =)  18. Fibrous roots in streambed 3 2 1 0  19. Rooted upland plants in streambed 3 2 1 0  20. Macrobenthos (note diversity and abundance) 0 1 2 3  21. Aquatic Mollusks 0 1 2 3  22. Fish 0 0 0.5 1 1.5  23. Crayfish 0 0.5 1 1.5  24. Amphibians 0 0.5 1 1.5  25. Algae 0 0.5 1 1.5  26. Wetland plants in streambed FACW = 0.75; OBL = 1.5 Other = 0  *perennial streams may also be identified using other methods. See p. 35 of manual.  Notes: NC data for this resource not available (no field sheets). Field Sheet filled out from GIS and photos. No standard in the National Hydrography Database.	-	1.5			
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Total       No = 0       Yes = 3         C. Biology (Subtotal =)       No = 0       Yes = 3         C. Biology (Subtotal =)       No = 0       Yes = 3         18. Fibrous roots in streambed       3       2       1       0         19. Rooted upland plants in streambed       3       2       1       0         20. Macrobenthos (note diversity and abundance)       0       1       2       3         21. Aquatic Mollusks       0       1       2       3         22. Fish       0       0.5       1       1         23. Crayfish       0       0.5       1       1         24. Amphibians       0       0.5       1       1         25. Algae       0       0.5       1       1         26. Wetland plants in streambed       FACW = 0.75; OBL = 1.5 Other = 0       *Perennial streams may also be identified using other methods. See p. 35 of manual.         Notes: NC data for this resource not available (no field sheets). Field Sheet filled out from GIS and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos.	17. Soil-based evidence of high water table?       No = 0       Yes = 3         C. Biology (Subtotal =)       No = 0       Yes = 3         18. Fibrous roots in streambed       3       2       1       0         19. Rooted upland plants in streambed       3       2       1       0         20. Macrobenthos (note diversity and abundance)       0       1       2       3         21. Aquatic Mollusks       0       1       2       3         22. Fish       0       0.5       1       1.5         23. Crayfish       0       0.5       1       1.5         24. Amphibians       0       0.5       1       1.5         25. Algae       0       0.5       1       1.5         26. Wetland plants in streambed       FACW = 0.75; OBL = 1.5 Other = 0         *perennial streams may also be identified using other methods. See p. 35 of manual.         Notes: NC data for this resource not available (no field sheets). Field Sheet filled out from GIS and photos. No stable shown in the National Hydrography Database.	•				1.5
C. Biology (Subtotal =)         18. Fibrous roots in streambed       3       2       1       0         19. Rooted upland plants in streambed       3       2       1       0         20. Macrobenthos (note diversity and abundance)       0       1       2       3         21. Aquatic Mollusks       0       1       2       3         22. Fish       0       0.5       1       1         23. Crayfish       0       0.5       1       1         24. Amphibians       0       0.5       1       1         25. Algae       0       0.5       1       1         26. Wetland plants in streambed       FACW = 0.75; OBL = 1.5 Other = 0         *perennial streams may also be identified using other methods. See p. 35 of manual.         Notes: NC data for this resource not available (no field sheets). Field Sheet filled out from GIS and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos. No standards and photos.	C. Biology (Subtotal =)         18. Fibrous roots in streambed       3       2       1       0         19. Rooted upland plants in streambed       3       2       1       0         20. Macrobenthos (note diversity and abundance)       0       1       2       3         21. Aquatic Mollusks       0       1       2       3         22. Fish       0       0.5       1       1.5         23. Crayfish       0       0.5       1       1.5         24. Amphibians       0       0.5       1       1.5         25. Algae       0       0.5       1       1.5         26. Wetland plants in streambed       FACW = 0.75; OBL = 1.5 Other = 0         *perennial streams may also be identified using other methods. See p. 35 of manual.         Notes: NC data for this resource not available (no field sheets). Field Sheet filled out from GIS and photos. No standard plants in the National Hydrography Database.		_			
18. Fibrous roots in streambed       3       2       1       0         19. Rooted upland plants in streambed       3       2       1       0         20. Macrobenthos (note diversity and abundance)       0       1       2       3         21. Aquatic Mollusks       0       1       2       3         22. Fish       0       0.5       1       1         23. Crayfish       0       0.5       1       1         24. Amphibians       0       0.5       1       1         25. Algae       0       0.5       1       1         26. Wetland plants in streambed       FACW = 0.75; OBL = 1.5 Other = 0         *perennial streams may also be identified using other methods. See p. 35 of manual.         Notes: NC data for this resource not available (no field sheets). Field Sheet filled out from GIS and photos. No standards and photos. No standards are standards and photos. No standards are standards are standards are standards are standards.	18. Fibrous roots in streambed       3       2       1       0         19. Rooted upland plants in streambed       3       2       1       0         20. Macrobenthos (note diversity and abundance)       0       1       2       3         21. Aquatic Mollusks       0       1       2       3         22. Fish       0       0.5       1       1.5         23. Crayfish       0       0.5       1       1.5         24. Amphibians       0       0.5       1       1.5         25. Algae       0       0.5       1       1.5         26. Wetland plants in streambed       FACW = 0.75; OBL = 1.5 Other = 0         *perennial streams may also be identified using other methods. See p. 35 of manual.         Notes: NC data for this resource not available (no field sheets). Field Sheet filled out from GIS and photos. No standard shown in the National Hydrography Database.			L		
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21. Aquatic Mollusks       0       1       2       3         22. Fish       0       0.5       1       1         23. Crayfish       0       0.5       1       1         24. Amphibians       0       0.5       1       1         25. Algae       0       0.5       1       1         26. Wetland plants in streambed       FACW = 0.75; OBL = 1.5 Other = 0         *perennial streams may also be identified using other methods. See p. 35 of manual.         Notes: NC data for this resource not available (no field sheets). Field Sheet filled out from GIS and photos. No standard plants in the control of the co	21. Aquatic Mollusks       0       1       2       3         22. Fish       0       0.5       1       1.5         23. Crayfish       0       0.5       1       1.5         24. Amphibians       0       0.5       1       1.5         25. Algae       0       0.5       1       1.5         26. Wetland plants in streambed       FACW = 0.75; OBL = 1.5 Other = 0         *perennial streams may also be identified using other methods. See p. 35 of manual.         Notes: NC data for this resource not available (no field sheets). Field Sheet filled out from GIS and photos. No standard shown in the National Hydrography Database.		0	1	2	3
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25. Algae  0 0.5 1 1.  26. Wetland plants in streambed  FACW = 0.75; OBL = 1.5 Other = 0  *perennial streams may also be identified using other methods. See p. 35 of manual.  Notes: NC data for this resource not available (no field sheets). Field Sheet filled out from GIS and photos. No see p. 35 of manual.	25. Algae  26. Wetland plants in streambed  *perennial streams may also be identified using other methods. See p. 35 of manual.  Notes: NC data for this resource not available (no field sheets). Field Sheet filled out from GIS and photos. No standard shown in the National Hydrography Database.		0		1	1.5
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Chewi in the Hatteria Hydrography Batabase.		,				
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#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Impact Cowardin Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 04 ۷A 02080105 12/14/2015 Stream Name and Information Name(s) of Evaluator(s) K. Astroth 04-STR-40 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Right bank - yard to Low Marginal: Non-maintained, High Poor: Lawns, mowed shed/building, Left ligh Suboptima High Marginal: Riparian areas ense herbaceou bank - some trees. Riparian areas and maintained Low Poor: vegetation, riparian areas with tree stratum Non-maintained with tree stratum (dbh > 3 inches) areas, nurseries Impervious surfaces, mine Field Sheet 12-A-(dbh > 3 inches) ense herhaceou no-till cropland present, with acking shrub and Tree stratum (dbh > 3 inches) presen spoil lands, STR-01. resent, with 30% to 60% tree actively grazed Riparian either a shrub 30% tree canon tree stratum, hav pasture, sparsely vegetated non-maintained area, with > 60% tree canopy cover and ar enuded surface cover and a maintained roduction, ponds open water. If laver or a tree canopy cover an containing both row crops, active eed lots, trails, or **Buffers** on-maintained understory. Wetland layer (dbh > 3 inches) present, understory present, tree herbaceous and recently seeded ther comparable Recent cutove with <30% tree stratum (dbh >3 shrub layers or a non-maintained and stabilized, o conditions. (dense vegetation). canopy cover. inches) present, with <30% tree her comparable condition. understory canopy cover with maintained High High High Low Low Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 5% 65% 30% 100% % Riparian Area> Right Bank 0.5 0.85 0.6 CI= (Sum % RA \* Scores\*0.01)/2

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

60%

0.85

40%

0.6

THE REACH CONDITION INDEX (RCI) >> 0.34

RCI= (Riparian CI)/2

Rt Bank CI >

Lt Bank CI >

0.58

0.75

CI

0.67

0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

100%

INSERT PHOTOS:

Left Bank

% Riparian Area>

Score >



Typical view of stream

NC DWQ Stream Identification Form Version 4.11

04-STR-40

Date: 12/14/2015	Project/Site: DC2RVA - Area 04	<b>Latitude:</b> 37.929107
Evaluator: K. Astroth	County: Caroline County	Longitude: -77.454761
Total Points: 15 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

0 0	1 1 1	2 2 2 2 2	3 3 3 3	
0	1	2	3	
0	1	2	3	
0				
$\overline{}$	1	2	2	
(0)			3	
, ~ <i>j</i>	1	2	3	
0	(1)	2	3	
0	1	2	3	
0	0.5	(1)	1.5	
0	0.5	1	1.5	
N	0 = 0	Yes:	= 3	
0	(1)	2	3	
0	1	2	(3)	
1.5	1	0.5	0	
0	0.5	1	1.5	
0	0.5	1	1.5	
N N	0 = 0	Yes:	= 3	
3	(2)	1	0	
(3)	2	1	0	
0	(1)	2	3	
0	1	2	3	
8	0.5	1	1.5	
0	0.5	1	1.5	
0	0.5	1	1.5	
0	0.5	1	1.5	
	FACW = 0.75; C	OBL = 1.5 Other = 0		
p. 35 of manu				
into WTL 14	4. Field Sheet 12-	A-STR-01.		
	0 0 0 1.5 0 0 N	0 1 0.5 0 0.5 No = 0  1 0 0.5 No = 0  1 1.5 1 0 0.5 0 0.5 No = 0  3 2 0 0.5 No = 0  3 2 0 0.5 0	0 1 2 0 0.5 1 0 0.5 1 0 0.5 1 No = 0 Yes = 0.5 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 FACW = 0.75; OBL = 1.5 Other = 0.5	0 1 2 3 0 0.5 1 1.5 0 0.5 1 1.5 0 No = 0 Yes = 3  0 1 2 3 0 1 2 3 1.5 1 0.5 0 0 0.5 1 1.5 0 0.5 1 1.5 0 0.5 1 1.5 0 0.5 1 1.5 0 0.5 1 1.5 0 0.5 1 1.5 0 0.5 1 1.5 0 0.5 1 1.5 0 0.5 1 1.5 0 0 0.5 1 1.5 0 0.5 0 0.5 1 1.5 0 0.5 1 1.5 0 0.5 1 1.5 0 0.5 1 1.5 0 0.5 1 1.5 0 0.

		Stre				Form	(For	m 1)			
				wadeable chan	nels classified a	s intermittent or	perennial		Impact/SAR	Impact	
Project #	l	Project Name	•	Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A		2RVA - Area		VA	R2SB	02080106	12/10/2015				
	e(s) of Evaluat Idnik, M. Roc	. ,	Stream Nam	e and Informa	ation	04-S	FD 44				
	Condition: Asse		tion of the atroom	and provoiling a	andition (arasian		K-41				
Channel				C	Conditional Catego	ry					
	Opti	mai	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	"	مويد المولا	Slightly incised for	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		Deeply incised	(or appointed)	
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-11 Stable point bars), are present. Acce floodplain or fully bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock-80%). AND/OR tures contribute to akfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be isient, contribute on that contribute to forming/present.	widen further. Major are near vertical. E 60-80% of banl protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the bd by sediment. orary/transient in outing to instability.	vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sk. Erosion/raw ban	stability. Severe tained within the do below average hajority of banks ut. Vegetative on less than 20% of venting erosion. Dughing present. ks on 80-100%.	
	sediment deposition 10% of I		sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the bark sediment depos	on is present on > iks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	uting to instability. channels and/or	CI
Score	3		L	.4	I	2	1.		tly lacking		2.4
								12-STR-08	•		
. RIPARIAI	N BUFFERS: A		Con	ditional Cate	gory		ts of length & widt	h may be accep	notable)		
Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, unopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	*	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained		h may be accep	otable)	by pipeline does not nave eam t that	
Riparian	Opti  Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, unopy cover and a derstory. Wetlands	Con Subo Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	NOTES>> Section of disrupted to corridor. It appear to haltered streecourse, but section is noted.	by pipeline does not nave eam t that	
Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Section of disrupted to corridor. It appear to haltered streecourse, but section is noted.	by pipeline does not nave eam t that	
Riparian Buffers  Condition Scores  Delineate ripales of the condition of	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the	mal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, course, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Section of disrupted to corridor. It appear to haltered streecourse, but section is noted.	by pipeline does not nave eam t that	
Riparian Buffers  Condition Scores  Delineate ripe Secriptors. Determine Scolow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the	mal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, de lands of conditions.  Low Poor: Impervious surfaces, mine spoil lands, de lands, de lands of conditions, trails, or other comparable conditions.  Low 0.5	NOTES>> Section of disrupted to corridor. It appear to haltered streecourse, but section is noted.	by pipeline does not nave eam t that	
Riparian Buffers  Condition Scores  Delineate ripe Secriptors. Determine Scolow. Enter the % I	Tree stratum (dbh > with > 60% tree ca anon-maintained unclocated within the located with	mal  3 inches) present, inopy cover and a derstory. Wetlands er parian areas.  5  each stream ban ach by measurin  Score for each ri  10%  0.5	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 10% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. ( n the blocks below 80% 1.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	NOTES>> Section of disrupted & corridor. It appear to haltered strecourse, but section is vidisturbed.	oy pipeline does not nave earm t that very	
Riparian Buffers  Condition Scores  Delineate ripascriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located	mal  3 inches) present, nopy cover and a terstory. Wetlands e riparian areas.  5  ach stream ban ach by measurin Score for each ri 10%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, course, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Section of disrupted k corridor. It appear to h altered strecourse, bu section is v disturbed.	by pipeline does not nave eam t that very	CI 1.32
Riparian Buffers  Condition Scores  Delineate ripscriptors. Determine solow. Enter the % I	Tree stratum (dbh > with > 60% tree cannon-maintained uncontrol located within the locate	mal  3 inches) present, unopy cover and a derstory. Wetlands er riparian areas.  5  ach by measurin  Score for each ri  10%  0.5  10%  0.85  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 10% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. ( n the blocks belov 80% 1.5  80% 1.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, del lands, del lands crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Section of disrupted & corridor. It appear to haltered strecourse, but section is vidisturbed.  CI= (Sum % RA*S Rt Bank CI >	oy pipeline does not nave earn t that very	
Condition Scores  Delineate rips scriptors. Determine scolow. Enter the % I Right Bank  Left Bank  INSTREAL	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	mal  3 inches) present, nopy cover and a ferstory. Wetlands er ipparian areas.  5  5  5  6  6  7  8  8  8  8  8  8  8  8  8  9  9  10%  0.5  10%  0.85  10%  0.85  10%  0.85  10%  0.85  10%  0.85	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 10% 0.5  10% 0.5	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Coungth and width. (in the blocks below 80% 1.5  80% 1.5  y and depths; wores. Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	NOTES>> Section of disrupted to corridor. It appear to haltered strecture, but section is well disturbed.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	oy pipeline does not nave earn t that very	
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/ Available	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	mal  3 inches) present, nopy cover and a ferstory. Wetlands er ipparian areas.  5  5  5  5  6  6  7  8  7  8  8  8  8  8  8  8  8  8  8	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 10% 0.5  10% U.5  Subo Stable habitat ele present in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. (and the blocks below 80% 1.5  80% 1.5  y and depths; wores.  Conditional ptimal ments are typically 6 of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you  ginal ments are typically & of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  Habitat elements lacking or are ur	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Section of disrupted to corridor. It appear to haltered strecture, but section is with the course, but section is with the course of t	oy pipeline does not nave earn t that very	
Condition Scores  Delineate rip. Secriptors. Determine scolow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	mal  3 inches) present, inches) present, inches present, inches present, inches present, inches present a derstory. Wetlands er inches present inches presen	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le sparian category in 10% 0.5  10% 0.5  Subo Stable habitat ele present in 30-509 are adequate fo popul	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. ( n the blocks belov 80% 1.5  y and depths; wo res.  Conditiona ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substrations are typically ments are typically ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ed  All Control of the control of t	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed folts, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Section of disrupted to corridor. It appear to haltered strecture, but section is with the course, but section is with the course of t	oy pipeline does not nave earn t that very	

	St	ream In	npact A	ssessm	ent For	rm Page	e 2		
Project #	Applicant		Locality	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2SB	02080106	12/10/2015	04-STR-41		
	ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, boil piles, constrictions, livestock  Conditional Category								
	Negligible	IVII	nor		erate		ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	is disrupted by any of the channel		of the channel in the parameter PR 80% of banks bion, riprap, or		
	1.5	1.3	1.1	0.9	0.7	0.	_	1	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View upstream toward tracks Top Right: View downstream Bottom Left: View of stream in woods Bottom Right: View of stream along rail

Project/Site: DC2RVA - Area 04

NC DWQ Stream Identification Form Version 4.11

Date: 12/10/2015

04-STR-41

Latitude: 37.925421

Evaluator: J. Budnik, M. Rockwell	County: Carolin	e County	Longitude: -77	7.461224
<b>Total Points:</b> 35.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) rmittert Perennia		:
A Coomerphology (Subtetal 13.5	Absent	Weak	Moderate	Strong
A. Geomorphology (Subtotal = 13.5 )  1 <sup>a.</sup> Continuity of channel bed and bank	O Absent	(1)		<del>                                     </del>
	0		$\frac{2}{2}$	3
Sinuosity of channel along thalweg     In-channel structure: ex. riffle-pool, step-pool,	0	1	$\overline{}$	3
ripple-pool sequence	0	1	(2)	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	<u>(1)</u>	2	3
7. Recent alluvial deposits		1	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual	I.	I.		
B. Hydrology (Subtotal = 9				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	Y	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1)_	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
C. Biology (Subtotal = 13				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	1	(2)	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75; C	DBL = 1.5 Other = 0	
*perennial streams may also be identified using other met	hods. See p. 35 of manua	ıl.		
Notes: Stream originates in railroad ditch and c	ulvert, flows into PF0	O wetland outside	of study boundar	y. This is the
same stream as 04-STR-43. Field Shee			-	_

			Unit	ieu Stream iv	lethodology f	o. acc t	jinia			l
			For use in	wadeable chan	nels classified a	s intermittent or	perennial		I	l
Project #	Pr	oject Name	)	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2I	RVA - Area	04	VA	R2	02080106	12/10/2015			
Nam	ne(s) of Evaluato	r(s)	Stream Name	e and Informa	ation					
J. Bı	udnik, M. Rock	well				04-S	TR-42			
. Channel (	Condition: Assess	the cross-sec	tion of the stream		ondition (erosion, onditional Categor					
	Optim	al	Subo	ptimal		ginal	Po	or	Sev	/ere
	many and a second	عملا	Olimbility is relied to			less than Severe or stable than Severe	Overwidend Vertically/laterally		1	5
Channel Condition	Very little incision or at 100% stable banks surface protection o prominent (80-100') Stable point bars/bar are present. Access floodplain or fully de bankfull benches. Min and transverse bars sediment deposition c	s. Vegetative r natural rock, %). AND/OR nkfull benches to their original eveloped wide d-channel bars, few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60-Depositional feat stability. The ban channels are wel likely has access to or newly developed portions of the r	ion or natural rock 80%) AND/OR ures contribute to kfull and low flow 1 defined. Stream 5 bankfull benches, d floodplains along each. Transient	or Poor due to lo Erosion may be pri both banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sec temporary/trans instability. Depositio stability, may be	wer bank slopes. esent on 40-60% of tative protection on Streambanks may vircut. AND/OR 40- n is covered by diment may be sient, contribute	widen further. Maj are near vertical. E 60-80% of banl protection prese banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contril AND/OR V-shall verotective vegetative protecti	ority of both banks crosion present on ks. Vegetative to 10-40% of fficient to prevent R 60-80% of the ad by sediment. orary/transient in outing to instability. ad channels have	vertical/lateral in incision, flow cor banks. Streambe rooting depth, revertical/underc protection present of banks, is not pre Obvious bank sle Erosion/raw bar AND/OR Aggradin	g channel. Greater
_	10% of bot	ttom.	stream		vegetative protecti banks and depositi contribute	on on > 40% of the onal features which to stability.	40% of the bar sediment depos	nks and stable sition is absent.	deposition, contrib Multiple thread subterran	
Score	3		2	.4	2	2	1.	.6	1	1
. RIPARIA	N BUFFERS: Ass			ditional Cate	gory	ugh measuremen	ts of length & widt		NOTES>> Left bank i	e
Riparian Buffers	Tree stratum (dbh > 3 with > 60% tree cano non-maintained under located within the ri	inches) present, py cover and a story. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious arriaces, mine spoil lands, denuded surfaces, row crops, active feed jobs, active feed of the comparable conditions.	bordered b	
				I OW			High			
Condition	4.5		High	Low	High	Low	_	Low		
Scores  Delineate ripescriptors. Determine selow.	arian areas along eac quare footage for eac Riparian Area and Sc % Riparian Area>	h by measurin	1.2 k into Condition C	1.1 ategories and Co	0.85 Indition Scores us	0.75	0.6  Ensure the of % R Blocks en	0.5 he sums		
Delineate rip escriptors. Determine so elow. Enter the %	oarian areas along eac quare footage for eac Riparian Area and Sc % Riparian Area>	ch by measurin core for each ri	1.2 k into Condition C	1.1 ategories and Co	0.85 Indition Scores us	0.75	0.6  Ensure the of % R	0.5 he sums iparian qual 100	Cl≕ (Sum % RA * S	cores*0.01)/2
Delineate rippesscriptors. Determine selow. Enter the % Right Bank	oarian areas along eac quare footage for eac Riparian Area and Sc % Riparian Area>	th by measuring to the core for each ring 100% 0.85	1.2 k into Condition C	1.1 ategories and Co	0.85 Indition Scores us	0.75	0.6  Ensure the of % R	0.5 he sums iparian qual 100	Rt Bank CI >	0.85
Delineate rip secriptors. Determine selow. Enter the % Right Bank Left Bank	parian areas along eac quare footage for eac Riparian Area and Sc % Riparian Area> Score >	ch by measurin core for each ri 100% 0.85 100% 0.6	1.2 k into Condition C g or estimating ler parian category in	1.1 ategories and Co	0.85 Indition Scores us Calculators are prov.	0.75 sing the ovided for you	O.6  Ensure the of % R Blocks en	0.5 he sums iparian qual 100 100%	Rt Bank CI >	,
Delineate ripescriptors. Determine such such such such such such such such	parian areas along eac quare footage for eac Riparian Area and So % Riparian Area> Score > % Riparian Area> Score >	core for each ri 100% 0.85 100% 0.6 ed substrate si	tinto Condition C g or estimating let parian category ir	ategories and Congth and width. Con the blocks below	0.85 Indition Scores us Calculators are prov.	0.75 sing the ovided for you	O.6  Ensure the of % R Blocks en	0.5 he sums iparian qual 100 100%	Rt Bank CI >	0.85
Delineate ripescriptors. Determine stelow. Enter the % Right Bank Left Bank INSTREA	varian areas along eac quare footage for eac Riparian Area and Sc % Riparian Area> Score > % Riparian Area> Score >  M HABITAT: Varies; root mats; SAV; riffe	core for each ri 100% 0.85 100% 0.6 ed substrate si	tinto Condition C g or estimating let parian category ir  zes, water velocit exes, stable feature	ategories and Congth and width. Conthe blocks below	0.85 Indition Scores us Calculators are prov.	0.75 sing the ovided for you oris; stable substr	O.6  Ensure the of % R Blocks en	0.5 he sums iparian qual 100 100% 100%	Rt Bank CI >	0.85
Delineate rip secriptors. Determine selow. Enter the % Right Bank  Left Bank  INSTREA ndercut banks  Instream Habitat/	parian areas along eac quare footage for eac Riparian Area and So % Riparian Area> Score > % Riparian Area> Score >	core for each ri 100% 0.85 100% 0.6 ed substrate si	tinto Condition C g or estimating lei parian category ir  zes, water velocit exes, stable featur	ategories and Congth and width. Con the blocks below	0.85 Indition Scores us Calculators are prov.  ody and leafy deb	0.75 sing the ovided for you oris; stable substr	o.6  Ensure the of % R Blocks en	0.5 he sums iparian qual 100 100% 100%	Rt Bank CI >	0.85
Delineate rip secriptors. Determine selow. Enter the % Right Bank  Left Bank  INSTREA Instream Habitat/ Available	warian areas along eac quare footage for eac Riparian Area and Sc % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Varies; root mats; SAV; riffle	core for each ri 100% 0.85 100% 0.6 ed substrate si e poole comple	tinto Condition C g or estimating let parian category in  zes, water velocit exes, stable featur  Subor Stable habitat elepresent in 30-50%	ategories and Congth and width. Congth and width. Congth and depths; wo year.  Conditiona potimal ments are typically 6 of the reach and	0.85 Indition Scores us Calculators are prov.  ody and leafy debut Category  Stable habitation Stable habitation	0.75  sing the ovided for you oris; stable substructions ginal ments are typically 6 of the reach and	o.6  Ensure the of % R Blocks end  ate; low embeded  Pool Habitat elements lacking or are ur	0.5 he sums iparian qual 100 100% 100%  Iness; shade; or listed above are	Rt Bank CI > Lt Bank CI > NOTES>>	0.85
Delineate rip secriptors. Determine selow. Enter the % Right Bank  Left Bank  INSTREA adercut banks  Instream Habitat/	warian areas along eac quare footage for eac Riparian Area and Sc % Riparian Area> Score > % Riparian Area> Score > M HABITAT: Varie ; root mats; SAV; riffle	core for each ri 100% 0.85 100% 0.6 ed substrate si e poole comple	tinto Condition C g or estimating lei parian category ir  zes, water velocit exes, stable featur  Subor  Stable habitat elei present in 30-509 are adequate for populi	ategories and Congth and width. Congth and width. Congth and depths; wo yes.  Conditiona of timal ments are typically 6 of the reach and maintenance of	ondition Scores us Calculators are prov.  I Category  Mary  Stable habitat eler present in 10-309 are adequate for popul	0.75 sing the ovided for you ovided	O.6  Ensure the of % R Blocks en ate; low embeded	0.5 he sums iparian qual 100 100% 100%  ress; shade;  or listed above are stable. Habitat ally present in less f the reach.	Rt Bank CI > Lt Bank CI > NOTES>>	0.85

	St	ream In	npact A	ssessm	ent For	m Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2	02080106	12/10/2015	04-STR-42			
4. CHANNEI	_ ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of ch	nannel, channeliz	ation,	NOTES>>		
embankments, s	poil piles, constrictions, livestock		Conditiona					Railroad b	orderes	
	Negligible	Mi	nor		erate	Sev	ere	stream.		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	disrupted by any alterations listed guidelines AND/C shored with gai cem	r of the channel in the parameter PR 80% of banks bion, riprap, or ent.			CI
SCORE	1.5	1.3	1.1	0.9	0.7	0.				1.30
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			
NOTE: The CIs and R	CI should be rounded to 2 decimal places. T	he CR should be roun	nded to a whole number	er.				CONDITION INI		
								I= (Sum of all C		0
								I X LF X IF	(∪K) >>	U
INSERT PHO	TO0:						5110			
DESCRIBE F	PROPOSED IMPACT:									

Project/Site: DC2RVA - Area 04

NC DWQ Stream Identification Form Version 4.11

Date: 12/10/2015

04-STR-42

Latitude: 37.925658

<b>Fotal Points:</b> 36.5 Stream is at least intermittent $f \ge 19$ or perennial if $\ge 30^*$		nation (circle one) rmitte t Perennia		
A. Geomorphology (Subtotal = 14.5	Absent	Weak	Moderate	Strong
a. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
B. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
I. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
5. Depositional bars or benches	0	(1)	2	3
. Recent alluvial deposits	0		2	3
B. Headcuts	0	$\bigcirc$	2	3
). Grade control	0	0.5	1	1.5
0. Natural valley	0	0.5		1.5
Second or greater order channel	No	0 = 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual				
3. Hydrology (Subtotal = <u>7.5</u> )				T
2. Presence of Baseflow	0	1	2	3
3. Iron oxidizing bacteria	0	(1)	2	3
4. Leaf litter	1.5	Y	0.5	0
5. Sediment on plants or debris	0	0.5	1	1.5
6. Organic debris lines or piles	0	0.5	1	1.5
7. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 14.5)				
8. Fibrous roots in streambed	3	2	1	0
Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	Ō	1	(2)	3
21. Aquatic Mollusks	0	1	(2)	3
22. Fish	0	0.5	<u> </u>	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed			BL = 1.5 ther = 0	)
*perennial streams may also be identified using other method	ds. See p. 35 of manua	ıl.		

-culvert Wetland 13

Wetland 13

		Stre					ı (Fori	m 1)			
				fied Stream N wadeable chan							
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area	-	VA	R2	02080106	12/10/2015				
	e(s) of Evaluat		Stream Nam	e and Informa	ation	04.0	FD 40				
	idnik, M. Roc			1 22	P.C. Constant		ΓR-43				
Channel C	Condition: Asse				onditional Catego	ry	Po		Sec.		
	Opti	IIIdi	Subo	pumai	IVIAI	ginal	W	OI .	Sev	rere	
	"Value	JAKA.	Cliability incinced 6	awaran of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		1	5	
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-10 Stable point bars/t are present. Acces floodplain or fully	ks. Vegetative or natural rock, 00%). AND/OR pankfull benches as to their original developed wide	erosion or unproter of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we	ew areas of active cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow Il defined. Stream o bankfull benches,	or Poor due to lo Erosion may be pro both banks. Veget 40-60% of banks. bevertical or unde 60% of strean sediment. Sec	stable than 3evere were bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient. contribute	widen further. Major are near vertical. E 60-80% of bank protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp	ority of both banks rosion present on as. Vegetative at on 20-40% of ficient to prevent to 60-80% of the d by sediment.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre	eut. Vegetative on less than 20% of eventing erosion.	
	bankfull benches. I and transverse ba sediment deposition 10% of b	Mid-channel bars, rs few. Transient n covers less than	or newly develope portions of the r sediment cover	o bankfull benches, id floodplains along reach. Transient rs 10-40% of the bottom.	instability. Deposition stability, may be AND/OR V-shap vegetative protecti banks and depositi	on that contribute to forming/present. ed channels have on on > 40% of the ional features which to stability.	nature, and contrib AND/OR V-shape vegetative protectic 40% of the bar sediment depos	uting to instability. d channels have on is present on > ks and stable	Erosion/raw ban AND/OR Aggradin	g channel. Greater n bed is covered by outing to instability. channels and/or	CI
Score	3			.4	-	2	1.	-	tly lacking		2.4
NOTES>>		protection	on. This is	the same s	tream as 04	4-STR-41. F	ield Sheet	12-STR-08	,Team A.		
	N BUFFERS: A	ssess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep	table)		
RIPARIAN	Optin  Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a erstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy	e entire SAR. (roo	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained		h may be accep	table)	oy pipeline does not nave eam t that	
RIPARIAN	Option  Tree stratum (dbh > with > 60% tree canon-maintained und	mal  3 inches) present, nopy cover and a erstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree cappy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	NOTES>> Section of disrupted I corridor. It appear to I altered stre course, bu section is	oy pipeline does not nave eam t that	
RIPARIAN Riparian Buffers	Option  Tree stratum (dbh > with > 60% tree canon-maintained und	mal  3 inches) present, nopy cover and a erestory. Weldands riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hap production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a href="#">30% tree canopy cover with maintained understory.</a>	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Section of disrupted I corridor. It appear to I altered stre course, bu section is	oy pipeline does not nave eam t that	
RIPARIAN Riparian Buffers  Condition Scores Delineate ripascriptors. Determine solow.	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a reestory. Wetlands riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Categories and Congth and width. Congth and width. Congth and width. Congth and with and with and with a congth and with a congth and with a congth and with a congth and with a congth and width. Congth	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spell lands, sorlaces, roine surfaces, roine surfaces, roine lotts, trails, or other comparable conditions.  Low 0.5	NOTES>> Section of disrupted I corridor. It appear to I altered stre course, bu section is	oy pipeline does not nave eam t that	
RIPARIAN Riparian Buffers  Condition Scores Delineate ripascriptors. Determine socious. Enter the % 6	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a erstory. Wetlands riparian areas.	C's 100 foot riparia  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr	Low Poor: Impervious surfaces, mine spoil lands, of lands, or crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Section of disrupted I corridor. It appear to I altered stre course, bu section is	oy pipeline does not nave eam t that	
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RIPARIAN Riparian Buffers  Condition Scores  Delineate rips scriptors. Determine sclow. Enter the % F	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the arian areas along equare footage for earing area and search area.	mal  3 inches) present, noches present, noches present, noches present, noches present, noches present, noches present, noches present present, noches present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10%	ditional Categories and Congth and width. Categories and Congth and Width. Categories and Congth an	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr	Low Poor: Impervious surfaces, mine spell lands, sorlaces, roine surfaces, roine surfaces, roine lotts, trails, or other comparable conditions.  Low 0.5	NOTES>> Section of disrupted I corridor. It appear to I altered strecourse, bu section is disturbed.	by pipeline does not nave eam t that very	CI 1.32
RIPARIAN  Riparian Buffers  Condition Scores  Delineate rips scriptors. Determine sclow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	assess both bank mal  3 inches) present, nopy cover and a restory. Weld and seristory weld and seristory are and and by measurin score for each ri 10% 0.5  10% 0.85 ried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.5  10% 0.5  Zes, water velocid	ditional Categories and Congth and width. Categories and Congth an	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prov.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum nay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, del udded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  The sums parian qual 100 100%	NOTES>> Section of disrupted I corridor. It appear to I altered strecourse, bu section is disturbed.  Cl= (Sum % RA * S	oy pipeline does not nave earn t that very	
RIPARIAN Riparian Buffers  Condition Scores  Delineate ripa Scriptors. Determine scolow. Enter the % If Right Bank  Left Bank  INSTREAN dercut banks;	Tree stratum (dbh > with > 60% tree ca anon-maintained und located within the located wit	assess both bank mal  3 inches) present, nopy cover and a restory. Weld and serior areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.5  10% 0.5  Zes, water velocii	ditional Categories and Congth and width. Categories and Congth an	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dhb > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the condition of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum nay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, del udded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  The sums parian qual 100 100%	NOTES>> Section of disrupted I corridor. It appear to I altered strecourse, bu section is disturbed.  Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl>	oy pipeline does not nave earn t that very	
RIPARIAN Riparian Buffers  Condition Scores  Delineate ripa scriptors. Determine sclow. Enter the % fi Right Bank  Left Bank  INSTREAN dercut banks;	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	ssess both bank mal  3 inches) present, nopy cover and a erstory. Wetlands riparian areas.  5 each stream ban ach by measurin 10% 0.5 10% 0.85 ried substrate si ffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.5  10% 0.5  zes, water velocii xees, stable featu	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and County and the blocks below 80% 1.5  80% 1.5  ty and depths; wo res.  Conditiona ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85 Indition Scores us Calculators are provided to the condition of the condition	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ee	Low Poor: Impervious surfaces, mine spoil lands, del lands, or corps, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Section of disrupted I corridor. It appear to I altered strecourse, bu section is disturbed.  Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl>	oy pipeline does not nave earn t that very	
Riparian Buffers  Condition Scores  Delineate rips secriptors. Determine solow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	ssess both bank mal  3 inches) present, nopy cover and a erstory. Wetlands riparian areas.  5 each stream ban ach by measurin 10% 0.5 10% 0.85 ried substrate si ffle poole comple mal e typically present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.5  zes, water velocit exes, stable featu Subo Stable habitat ele present in 30-50% are adequate fo	Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. (congth and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicate the canopy cover.  All Category  Mar.  Stable habitat ele present in 10-30% are adequate for a control of the con	ugh measuremen  Ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized condition.  High  0.6  Ensure the of % R Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, del unded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  100%  100%	NOTES>> Section of disrupted I corridor. It appear to I altered strecourse, bu section is vidisturbed.  Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl> NOTES>>	oy pipeline does not nave earn t that very	

	St	ream In	npact A	ssessm	ent For	m Page	<b>2</b>		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2	02080106	12/10/2015	04-STR-43		
	ALTERATION: Stream cross poil piles, constrictions, livestock	sings, riprap, conc	rete, gabions, or		straightening of ch	hannel, channeliz	ation,	NOTES>>	
	Negligible	Mir	nor	Mode	erate	Sev	ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	is disrupted by any of the channel	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with ga cem	of the channel in the parameter PR 80% of banks bion, riprap, or		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View upstream toward tracks Top Right: View downstream Bottom Left: View of stream in woods Bottom Right: View of stream along rail

Project/Site: DC2RVA - Area 04

NC DWQ Stream Identification Form Version 4.11

Date: 12/10/2015

04-STR-43

Latitude: 37.925421

Evaluator: J. Budnik, M. Rockwell	County: Caroline	e County	Longitude: -77	.461224
<b>Total Points:</b> 35.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determine Ephemeral Inter			
A. Geomorphology (Subtotal = 13.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	1	2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	11	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	= 0	Yes :	= 3)
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 9)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	Y	0.5	0
15. Sediment on plants or debris	0	0.5		1.5
16. Organic debris lines or piles	0	0.5	0_	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes :	= 3
C. Biology (Subtotal = 13				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	Ō	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	<b>D</b>	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed			OBL = 1.5 Other = 0	
*perennial streams may also be identified using other met	•			
Notes: Stream originates in railroad ditch and c			le of study boundary	y. This is the
same stream as 04-STR-41. Field Shee	t 12-STR-08 Team A		-	
Sketch: PFO wooded area	eline debri	culvert	re	
	debris			

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
					nels classified a	s intermittent or			Impact/SAR	Impact	
Project #		Project Name	•	Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R4SB	02080106	12/10/2015				
	e(s) of Evalua Idnik, M. Roc		Stream Nam	e and Informa	ation	04.67	ΓR-44				
	Condition: Asse		4i				K-44				
Channel				C	Conditional Catego	ry					
	Opti	ımaı	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
		Who have	Slightly incised, fu	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		Deeply incised	(or excavated)	
Channel Condition	100% stable bar surface protection prominent (80-1	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Major are near vertical. E 60-80% of banh protection preser banks, and is insurerosion. AND/OF stream is covere Sediment is tempnature, and contrib AND/OR V-shape.	rosion present on ks. Vegetative nt on 20-40% of fficient to prevent & 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, n vertical/underc protection present obanks, is not pre Obvious bank sle Erosion/raw ban	stability. Severe tained within the ad below average tajority of banks ut. Vegetative on less than 20% of eventing erosion. Doughing present. ks on 80-100%.	
	sediment deposition 10% of	on covers less than bottom.	sediment cover	each. Transient is 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the band	on is present on > iks and stable	AND/OR Aggradin than 80% of stream deposition, contrib Multiple thread subterran	uting to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1	l	2.0
NOTES>>	N BUFFERS: /	Accord both bank	y's 100 faat ringris			STR-07,Tea		h may ba accon	stable)		
. KIFAKIAI	N BOFFERS. F	Assess both barr		ditional Cate		ugri measuremen	is or length & widt	п тау ве ассер	NOTES>>		
	Opti	imal		ptimal		ginal	Po	or	Riparian a	ea has	
Riparian Buffers		anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	been clear pipeline ac Mainly her some secti vegetation	tivity. baceous, ons lack	
			High	Low	High	Low	High	Low			
Condition Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
escriptors.  Determine solelow.	arian areas along quare footage for e Riparian Area and	each by measurin	g or estimating le	ngth and width. (	Calculators are pr	· ·	Ensure the of % R	iparian			
Right Bank	% Riparian Area>	100% 0.75						100%	CI= (Sum % RA * S	coros*0.04\/2	
	% Riparian Area>	100%						100%	CI= (Sum % RA * S Rt Bank CI >	0.75	CI
Left Bank	Score >	0.75							Lt Bank CI >	0.75	0.75
INSTREAM	M HABITAT: Va				ody and leafy deb	oris; stable substr	ate; low embeded	ness; shade;	NOTES>>		
		iiile poole comple	exes, stable featu		I Category				Instream h	abitat is	
ndercut banks;	Tool mats, SAV, I			Conditions							
ndercut banks;		imal		ptimal		ginal	Po		stable for s		
Instream Habitat/ Available	Opti	re typically present	Stable habitat eler present in 30-50%	ptimal ments are typically 6 of the reach and	Stable habitat ele present in 10-30%	ments are typically % of the reach and	Habitat elements lacking or are un	listed above are stable. Habitat	stable for s before stre wetland in	am and	
Instream Habitat/	Opti	re typically present 0% of the reach.	Stable habitat eler present in 30-50% are adequate fo popul	ptimal ments are typically	Stable habitat ele present in 10-30% are adequate fo popul	ments are typically	Habitat elements	listed above are stable. Habitat ally present in less the reach.	before stre	am and	CI 1.20

	St	ream In	npact A	ssessm	ent Fo	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB	02080106	12/10/2015	04-STR-44		
	L ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, conc			straightening of cl	hannel, channeliz	ation,	NOTES>> Pipeline co	orridor
			Conditiona			_		activity has	
	Negligible	Mir	nor	Mod	erate	Sev		_	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by am alterations listed guidelines AND/C shored with ga cem	00% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or	interrupted STR7 & Wi	
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5		
	REACH C	ONDITION IN	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH		
OTE: The CIs and R	RCI should be rounded to 2 decimal places. T	he CR should be roun	ded to a whole number	er.			THE REACH	CONDITION IN	DEX (RCI) >>
							RC	CI= (Sum of all C	l's)/5
							COMPENSAT	ION REQUIREM	MENT (CR) >>
						,	CR = RC	XLFXIF	

#### INSERT PHOTOS:



Top Left: 24 inch brick Culvert 12 Top Right: View upstream Bottom Left: View downstream Bottom Right: View downstream

NC DWQ Stream Identification Form Version 4.11

04-STR-44

Date: 12/9/2015	Project/Site: DC2RVA - Area 04	Latitude: 37.921853
Evaluator: J. Budnik, M. Rockwell	County: Caroline County	Longitude: -77.466008
<b>Total Points:</b> 25.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

1 1 1 1 1 1 1 0.5 0.5 = 0 1 1 0.5 0.5 = 0.5	2 2 2 2 2 2 2 2 1 1 1 Yes	3 3 0 1.5
1 1 1 0.5 0.5 = 0 1 1 0.5 0.5	2 2 2 2 2 2 2 1 1 1 Yes	3 3 3 3 3 1.5 1.5 = 3 3 0 1.5 1.5
1 1 0.5 0.5 = 0 1 0.5 0.5 0.5	2 2 2 2 2 1 1 1 Yes	3 3 3 3 1.5 1.5 = 3
1 1 0.5 0.5 = 0 1 0.5 0.5 0.5	2 2 2 2 2 1 1 1 Yes	3 3 3 3 1.5 1.5 = 3
1 0.5 0.5 0.5 0.5	2 2 2 2 1 1 1 Yes	3 3 3 1.5 1.5 = 3 3 0 1.5 1.5
1 0.5 0.5 = 0 1 0.5 0.5 0.5	2 2 1 1 1 Yes	3 3 1.5 1.5 = 3 3 3 0 1.5 1.5
1 0.5 0.5 = 0 1 1 0.5 0.5	2 2 1 1 1 Yes	3 3 1.5 1.5 = 3 3 3 0 1.5 1.5
1 0.5 = 0 1 1 0.5 0.5 0.5	2 1 1 Yes	3 1.5 1.5 = 3 3 3 0 1.5 1.5
0.5 0.5 = 0 1 1 0.5 0.5	1 1 Yes	1.5 1.5 = 3 3 3 0 1.5 1.5
1 1 0.5 0.5	1 Yes 2 2 0.5 1 1 1	1.5 = 3 3 3 0 1.5 1.5
1 1 0.5 0.5	2 2 0.5	3 3 0 1.5
0.5 0.5	2 2 0.5 1	3 3 0 1.5
0.5 0.5	2 0.5	3 0 1.5 1.5
0.5 0.5	2 0.5	3 0 1.5 1.5
0.5 0.5	2 0.5	3 0 1.5 1.5
0.5 0.5	0.5	0 1.5 1.5
0.5	1	1.5 1.5
0.5		1.5
= 0	Yes	= 3
2	1	0
2	1	0
1	2	3
1	2	3
0.5	1	1.5
0.5	1	1.5
0.5	1	1.5
0.5	1	1.5
FACW = 0.75,	OBL = 1.5 Other = 0	D .
Sheet 12-STR	-07 Team A.	
	0.5 0.5 FACW = 0.75,	0.5 1 0.5 1 FACW = 0.75, OBL = 1.5 Other = 0

WETLAND 6

		Stre					(For	m 1)			
				fied Stream N wadeable chan							
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area		VA	R2SB	02080106	12/10/2015				
	e(s) of Evaluat		Stream Nam	e and Informa	ation	04.07	FD 45				
	idnik, M. Roc		4:£ 4b4				ΓR-45				
. Channel C	Condition: Asset			C	Conditional Catego	ry	Po				
	Optio	IIIdi	Subo	ptimal	IVIAI	ginal	W	OI .	Sev	ere	
	-	ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN AL		ew areas of active	Poor. Banks more	less than Severe or stable than Severe	Overwidene Vertically/laterally to	ınstable. Likely to	Deeply incised	(or excavated),	
Channel Condition	Very little incision or 100% stable ban surface protection prominent (80-10 Stable point bars/t are present. Acces floodplain or fully bankfull benches. I and transverse ba	iks. Vegetative or natural rock, 00%). AND/OR bankfull benches as to their original developed wide Mid-channel bars,	of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow ill defined. Stream o bankfull benches, et floodplains along	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	wer bank slopes, essent on 40-60% of lative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to	widen further. Maji are near vertical. E 60-80% of banh protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	rosion present on is. Vegetative it on 20-40% of ficient to prevent 60-80% of the d by sediment. prary/transient in uting to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious bank sle Erosion/raw bank	stability. Severe tatained within the ed below average anjority of banks tut. Vegetative on less than 20% of eventing erosion. bughing present. iks on 80-100%.	
	sediment deposition 10% of b	covers less than	sediment cover	reach. Transient rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the onal features which to stability.	vegetative protection 40% of the band	on is present on > ks and stable		channels and/or	CI
Score	3		2	2.4		2	1.	6	1	l	2.4
NOTES>>			S	ome incisio	on. Field Sł	neet 12-STF	R-06,Team /	۹.			
. RIPARIAI	N BUFFERS: A	ssess both bank	d's 100 foot riparia	an areas along the	e entire SAR. (ro				table)		
. RIPARIAI			Con	ditional Cate	gory	ugh measuremen			table)		
. RIPARIAI	N BUFFERS: A		Con		gory	ugh measuremen		h may be accep		paceous	
RIPARIAI Riparian Buffers		mal  3 inches) present, nopy cover and a erstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	ts of length & widt	h may be accep	NOTES>> Dense herl layer. Tree present at edge of the buffer.	s are the outer	
Riparian	Option  Tree stratum (dbh > with > 60% tree canon-maintained und	mal  3 inches) present, nopy cover and a erstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with +30% tree canopy cover with	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	NOTES>> Dense herl layer. Tree present at edge of the buffer.	s are the outer	
Riparian	Option  Tree stratum (dbh > with > 60% tree canon-maintained und	3 inches) present, nopy cover and a restory. Wellands riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious sourfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Dense herl layer. Tree present at edge of the buffer.	s are the outer	
Riparian Buffers  Condition Scores  Delineate rip: escriptors. Determine so	Optia  Tree stratum (dbh > with > 60% tree can non-maintained und located within the	3 inches) present, nopy cover and a eristory. Wetlands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorian Categorian Categories and Coungth and width. Categories and with the categories and categor	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stablitzed, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Dense herl layer. Tree present at edge of the buffer.	s are the outer	
Riparian Buffers  Condition Scores  Delineate rip: escriptors. Determine so	Tree stratum (dbh > with > 60% tree can non-maintained und located within the	3 inches) present, nopy cover and a erestory. Weltands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorian Categorian Categories and Coungth and width. Categories and with the categories and categor	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Dense herl layer. Tree present at edge of the buffer.	s are the outer	
Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % I	Tree stratum (dbh > with > 60% tree can non-maintained und located within the	3 inches) present, nopy cover and a restory. Wellands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorian Categorian Categories and Coungth and width. Categories and with the categories and categor	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Dense herl layer. Tree present at edge of the buffer.	s are the outer e riparian	
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow.	Tree stratum (dbh > with > 60% tree can non-maintained und located within the located wit	3 inches) present, nopy cover and a restory. Wetlands riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categorian Categorian Categories and Coungth and width. Categories and with the categories and categor	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Dense herl layer. Tree present at edge of the buffer.  Cl= (Sum % RA*S Rt Bank CI>	s are the outer e riparian  cores*0.01)/2  0.85	CI
Riparian Buffers  Condition Scores  Delineate riprescriptors. Determine scelow. Enter the % I Right Bank	Tree stratum (dbh > with > 60% tree can non-maintained und located within the located wit	3 inches) present, nopy cover and a restory. Wellands or iparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ex	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%	NOTES>> Dense herl layer. Tree present at edge of the buffer.	s are the outer e riparian	CI 0.85
Riparian Buffers  Condition Scores  Delineate ripescriptors Determine scelow Enter the % I	Tree stratum (dbh > with > 60% tree can non-maintained und located within the located wit	3 inches) present, nopy cover and a restory. Wetlands riparian areas.  5  ach stream ban ach by measurin 100% 0.85  100% 0.85	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ex	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%	NOTES>> Dense herl layer. Tree present at edge of the buffer.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	s are the outer e riparian  cores*0.01)/2  0.85	
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  I. INSTREAI Indercut banks; Instream	Tree stratum (dbh > with > 60% tree can non-maintained und located within the located wit	3 inches) present, nopy cover and a eristory. Wetlands riparian areas.  5 ach stream ban ach by measuring 100% 0.85 100% 0.85 ried substrate siffle poole complete.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ex	Low Poor: Impervious surfaces, mine spoil lands, dendued surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Dense herl layer. Tree present at edge of the buffer.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	s are the outer e riparian  cores*0.01)/2  0.85	
Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/ Available	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located located within the located	mal  3 inches) present, nopy cover and a erestory. Wetlands riparian areas.  5  ach stream ban ach by measurint 100% 0.85  100% 0.85  ried substrate siffle poole complete the poole com	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Counth the blocks below t	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically 6 of the reach and	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  Ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Dense herl layer. Tree present at edge of the buffer.  Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl> NOTES>>	s are the outer e riparian  cores*0.01)/2  0.85	0.85
Riparian Buffers  Condition Scores  Delineate rip: escriptors. Determine scelow. Enter the % I Right Bank  Left Bank  Instream Habitat/	Tree stratum (dbh > with > 60% tree can non-maintained und located within the located wit	mal  3 inches) present, nopy cover and a restory. Wetlands riparian areas.  5  beach stream ban ach by measurin 100%  0.85  100%  0.85  ried substrate siffle poole comple mal  e typically present 1% of the reach.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ingth and width. (in the blocks below  ty and depths; wo res.  Conditiona ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  W.  Stable habitat ele present in 10-30% are adequate for popul	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present. The present, tree stratum (dbh > 3 inches) present. The present with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substrations are typically ments are typically ments are typically ments are typically ments are typically ments are typically substrations are typically ments are typ	ts of length & widt  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R Blocks ed  Blocks ed  All Comparable Blocks ed  High  Del Comparable All Comparable Condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, mine spoil lands, denuded surfaces, row crops, active fee lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%	NOTES>> Dense herl layer. Tree present at edge of the buffer.  Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl> NOTES>>	s are the outer e riparian  cores*0.01)/2  0.85	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor R2SB 02080106 12/10/2015 04-STR-45 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Culvert Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. is disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. CI 0.5 SCORE 1.5 1.3 1.1 0.9 0.7 1.30 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

**INSERT PHOTOS:** 



Top Left: View upstream
Top Right: View of 36 inch metal Culvert 11
Bottom Left: View downstream
Bottom Right: View of stream

NC DWQ Stream Identification Form Version 4.11

04-STR-45

Date: 12/9/2015	Project/Site: DC2RVA - Area 04	Latitude: 37.918908
Evaluator: J. Budnik, M. Rockwell	County: Caroline County	Longitude: -77.4681
<b>Total Points:</b> 36.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 17)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool,	0		2	3
ripple-pool sequence				
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0		2	3
6. Depositional bars or benches	0		2	3
7. Recent alluvial deposits	0	<u> </u>	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $9$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
C. Biology (Subtotal = $10.5$ )	•			
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	<u>(1)</u>	2	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	I I	FACW = 0.75.	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other metho	ds. See p. 35 of manua			·
Notes: Field Sheet 12-STR-06 Team A.	· · · · · · · · · · · · · · · · · · ·			
Sketch: culvert				
/ -				
				-

# Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

	For use in ephemeral streams								
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Area 04	VA	R6	02080106	12/10/2015				

Name(s) of Evaluator(s) Stream Name and Information

04-STR-46 J. Budnik, M. Rockwell

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Con	ditional Cate	gory				NOTES>>		1
	Optimal	Subo	ptimal	Mar	ginal	Po	oor	Stream ban	ks have	
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.		High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	been disrup pipeline roa currently fo rust. Almos vegetation. channel obs been disrup pipeline act Vegetation ruts have al	d. Stream llowing t no Stream served has sted by ivities. is cleared, tered	
		High	Low	High	Low	High	Low	course. Fiel		
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	STR-05 Tea		
<ol> <li>Delineate ripa</li> </ol>	rian areas along each stream bank	into Condition Cat	egories and Cond	ition Scores using	the descriptors.	Ensure	the sums			
<ol><li>Determine squ below.</li></ol>	uare footage for each by measuring	or estimating leng	th and width. Cal	culators are provi	ded for you	of % F	Riparian			
3. Enter the % R	iparian Area and Score for each rip	arian category in t	ne blocks below.			Blocks 6	qual 100			
Right Bank	% Riparian Area> 100%						100%			l
Nigin Balik	Score > <b>0.5</b>									
								CI= (Sum % RA * S		L
Left Bank	% Riparian Area> 100%						100%	Rt Bank CI >	0.50	L
	Score > 0.5							Lt Bank CI >	0.50	L

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.25 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

#### INSERT PHOTOS:



**NC DWQ Stream Identification Form Version 4.11** 

04-STR-46

THE BY & Stream Identification I of m	V CI STOTI T.11	0 - 0
Date: 12/9/2015	Project/Site: DC2RVA - Area 04	Latitude: 37.912136
Evaluator: J. Budnik, M. Rockwell	County: Caroline County	Longitude: -77.468458
<b>Total Points:</b> 11.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:
A Coomernholemy (Outstall 2	Abcont Work	Moderate Strong

A. Geomorphology (Subtotal = 3)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	(0)	7	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	E	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	( N	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 3)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	Y	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes	= 3
C. Biology (Subtotal = $5.5$ )				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish		0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method	ls. See p. 35 of manua	al.		
Notes: Stream is fed by wetland from other side of	f culvert. Pipeline	road has disrupt	ted original stream	path. Field
Sheet 12-STR-05 Team A.				
Sketch: woods ruts pipeling road debi	cul)er pipeline road	hill		
original channel				

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
D		Duning Albama			nels classified a	s intermittent or		045 "	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A		2RVA - Area		VA	R4SB	02080106	12/9/2015				
	e(s) of Evalua Idnik, M. Roc		Stream Nam	e and Informa	ation	04-S	ΓD_47				
	Condition: Asse		tion of the stream	and provailing o	andition (arasian		11\-41				
. Onamier C				C	Conditional Catego	ry	D-		0		
	Opti	ımaı	Subo	ptimal	Iviar	ginal	Po	or	Sev	ere	
		AND PARK	Slightly incised, for	ew areas of active	Poor. Banks more	less than Severe or stable than Severe	Overwidene Vertically/laterally u	ınstable. Likely to	Deeply incised	(or excavated).	
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse bar	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient	of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may brout. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Majr are near vertical. E 60-80% of banh protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	rosion present on as. Vegetative on 20-40% of fficient to prevent a 60-80% of the d by sediment. orary/transient in uting to instability.	vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious bank sk Erosion/raw bank	stability. Severe itained within the id below average najority of banks ut. Vegetative on less than 20% of eventing erosion. oughing present.	
	sediment deposition 10% of	on covers less than bottom.	sediment cover	s 10-40% of the bottom.	vegetative protecti banks and deposit	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the bard sediment depos	ks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability.	CI
Score	3	3	2	.4		2	1.	6	1	1	3.0
NOTES>>	N BUFFERS: A	Assess both bank	d's 100 foot riparia			STR-04,Tea		h may be accep	table)		
				ditional Cate			_		NOTES>>		
Riparian Buffers		> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal:  Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, eor other comparable conditions.	Field within has been c		
						maintained understory.					
Condition		-	High	Low	High	Low	High	Low	-		
0	4		1 1 2		N 0E	0.75	0.6	0.5		ı	
descriptors. 2. Determine so pelow.	arian areas along quare footage for e	each stream ban	g or estimating le	ngth and width. (	Calculators are pr	•	0.6  Ensure the of % R	parian			
Delineate ripe escriptors. Determine so elow. Enter the % I	arian areas along	each stream ban	k into Condition C	categories and Co	I ondition Scores us Calculators are pr	sing the	Ensure th	ne sums iparian			
Delineate ripa escriptors. Determine so elow. Enter the % I	arian areas along quare footage for e	each stream ban each by measurin Score for each r	k into Condition C	categories and Co	I ondition Scores us Calculators are pr	sing the	Ensure the	ne sums iparian qual 100			
Delineate rippessories. Determine solelow. Enter the % I	arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	each stream ban each by measurin Score for each r 100% 0.85	k into Condition C	categories and Co	I ondition Scores us Calculators are pr	sing the	Ensure the	pe sums parian qual 100 100%	Cl≕ (Sum % RA * S Rt Bank Cl >	,	CI
Delineate ripa escriptors. Determine so elow. Enter the % I	arian areas along quare footage for e Riparian Area and % Riparian Area>	each stream ban each by measurin Score for each r 100%	k into Condition C	categories and Co	I ondition Scores us Calculators are pr	sing the	Ensure the	ne sums iparian qual 100	Cl⊨ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2 0.85 1.20	CI 1.03
Delineate rip: lescriptors. Determine scelow. Enter the % I Right Bank Left Bank B. INSTREAI	arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Va	each stream ban each by measurin Score for each r 100% 0.85  100% 1.2 aried substrate si	k into Condition C g or estimating le parian category in	ategories and Congth and width. (	condition Scores us Calculators are pr v.	ovided for you	Ensure the of % R Blocks et	parian qual 100 100%	Rt Bank CI >	0.85	
Delineate rip: lescriptors. Determine scielow. Enter the % I Right Bank  Left Bank  INSTREAI	arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >	each stream ban each by measurin Score for each r 100% 0.85  100% 1.2 aried substrate si	k into Condition C g or estimating le parian category in	ategories and Congth and width. (	ondition Scores us Calculators are prov.	ovided for you	Ensure the of % R Blocks et	parian qual 100 100%	Rt Bank CI >	0.85	
Delineate rip: lescriptors. Determine scielow. Below. Right Bank Left Bank BINSTREAL	arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Va	each stream ban each by measurin Score for each r 100% 0.85  100% 1.2 aried substrate si	k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu	rategories and Congth and width. (In the blocks below	calculators are provided by the condition of the conditio	ovided for you  ovided for you  oris; stable substr	Ensure the of % R Blocks en	parian qual 100 100% 100%	Rt Bank CI >	0.85	
1. Delineate rip: descriptors. 2. Determine sc below. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/ Available	guare footage for e guare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Varoot mats; SAV; r  Opti Habitat elements a	each stream ban each by measurin Score for each r 100% 0.85  100% 1.2 aried substrate si iffle poole completimal re typically present	g or estimating le parian category in  zes, water velocit exes, stable featur  Subor  Stable habitat ele present in 30-50	rategories and Congth and width. (In the blocks below by and depths; wores.  Conditional ments are typically 6 of the reach and	ondition Scores us Calculators are pr v.  ody and leafy det  Il Category  Stable habitat ele present in 10-309	ovided for you  oris; stable substr  ginal ments are typically % of the reach and	Ensure the of % R Blocks en Blocks e	ne sums iparian qual 100 100% 100%  ress; shade;  or listed above are stable. Habitat	Rt Bank CI > Lt Bank CI >	0.85	
Delineate rip: lescriptors. Determine scielow. Below. Right Bank  Left Bank  Instream  Habitat/	arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Varoot mats; SAV; r	seach stream ban seach by measurin 100% 0.85 100% 1.2 aried substrate si iffle poole completimal re typically present 0% of the reach.	zes, water velocitiexes, stable feature Subor Stable habitat eler present in 30-50% are adequate for popul	ategories and Congth and width. (In the blocks below by and depths; wo res.  Conditional ments are typically ments are typically	ondition Scores us Calculators are pr w.  ody and leafy det Il Category  Mar Stable habitat ele present in 10-30; are adequate fo popul	ovided for you  ovided for you  ovided for you  ovided for you  ovided for you	Ensure the of % R Blocks et al. Blocks et al	ne sums iparian qual 100 100%  100%  100%  iness; shade;  or  listed above are stable. Habitat lily present in less the reach.	Rt Bank CI > Lt Bank CI >	0.85	

	St	ream In	npact A	ssessm	ent Fo	rm Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB	02080106	12/9/2015	04-STR-47		
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock  Conditional Category								NOTES>>	
	Negligible	Mi	nor		erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	in the parameter DR 80% of banks bion, riprap, or		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: View upstream

Top Right: View upstream at a large change in elevation Bottom Left: Culvert 07 - four foot metal culvert Bottom Right: Incised banks

NC DWO Stream Identification Form Version 4.11

04-STR-47

Date: 12/9/2015	Project/Site: DC2RVA - Area 04	Latitude: 37.904831
Evaluator: J. Budnik, M. Rockwell	County: Caroline County	Longitude: -77.467031
<b>Total Points:</b> 28.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

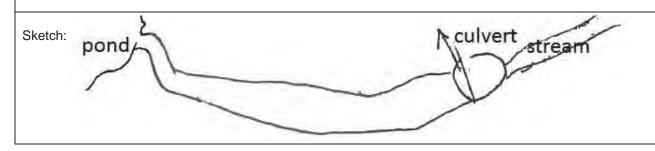
A. Geomorphology (Subtotal = 12.5)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0		2	3
8. Headcuts	0	9	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	( No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $7.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	<b>(</b> 1 <b>)</b>	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17 Soil-hased evidence of high water table?	N	0 = 0	Vac	- 2

12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	lo = 0	Yes =	= 3
C Riology (Subtotal = 8.5	•			

C. Biology (Subtotal = $8.5$				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	Q	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other = 0	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream 4 flows to a culvert where it meets with Stream 3. Field Sheet 12-STR-04 Team A.



		Stre		SSESS			-	m 1)			
				fied Stream N wadeable chan							
Project #	1	Project Name	)	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	04	VA	R4SB	02080106	12/9/2015				
	e(s) of Evalua	. ,	Stream Nam	e and Informa	ation						
J. Bu	dnik, M. Roc	kwell				04-S	ΓR-48				
. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opti	imal	Subo	ptimal c	onditional Catego	ry ginal	Po	or	Sev	ere	
	1	We have	1	~	1	5	Overwiden	adincised	1	5	
Channel Condition	100% Stable banks. Vegetative		100% stable banks. Vegetative surface protection or natural rock perminent (80-100%). AND/OR Stable point bars/bankfull benches re present. Access to their original floodplain or fully developed wide ankfull benches. Mid-channel bars, and the stability. The bankfull and low floodplain or fully developed wide ankfull benches. Mid-channel bars, and the stability of the stability of the stability. The bankfull and low floodplains are well defined. Stream likely has access to bankfull benches.		Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40- 60% of stream is covered by sediment. Sediment may be temporary/transient, contribute		widen further. Majority of both banks		been in the contained of the contained o		
	10% of		stream	rs 10-40% of the bottom.	vegetative protecti banks and depositi contribute	ed channels have ion on > 40% of the ional features which to stability.		ks and stable ition is absent.	than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.		CI
Score	3	3	2	.4		2	1.	6	1		2.4
NOTES>>				Field	Sheet 12-	5 i K-U3, i ea	IM A.				
2. RIPARIAN	N BUFFERS: A	Assess both bank	d's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen		h may be accep	etable)		
2. RIPARIAN			Con	ditional Cate	gory		ts of length & wid		NOTES>>		
RIPARIAN Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree		gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.		Or  Low Poor:		n riparian been gged. First ee cover aintained	
Riparian Buffers	Option  Tree stratum (dbh : with > 60% tree canon-maintained une	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cated ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> Field behin bank within buffer has clearcut/lo 25ft have to and non m	n riparian been gged. First ee cover aintained	
Riparian	Opti Tree stratum (dbh : with > 60% tree cc non-maintained une located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Field behin bank within buffer has clearcut/lo 25ft have to and non m	n riparian been gged. First ee cover aintained	
Riparian Buffers  Condition Scores  Delineate rips lescriptors. Determine scelow.	Tree stratum (dbh with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processed.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Field behin bank within buffer has clearcut/lo 25ft have to and non m	n riparian been gged. First ee cover aintained	
Riparian Buffers  Condition Scores  Delineate ripalescriptors. Determine scorelow.	Tree stratum (dbh : with > 60% tree conon-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processed.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Field behin bank within buffer has clearcut/lo 25ft have to and non m	n riparian been gged. First ee cover aintained	
Riparian Buffers  Condition Scores  Delineate rips lescriptors. Determine scelow.	Tree stratum (dbh with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each r 100% 1.1	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processed.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	NOTES>> Field behin bank within buffer has clearcut/lo 25ft have to and non m	n riparian been gged. First ee cover aintained	
Riparian Buffers  Condition Scores  Delineate rips lescriptors. Determine scelow.	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each r  100%  1.1	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processed.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Field behin bank within buffer has clearcut/log 25ft have to and non m understory  Cl= (Sum % RA * S Rt Bank Cl >	n riparian been gged. First ee cover aintained	CI
Riparian Buffers  Condition Scores  Delineate ripelescriptors Determine scelow Enter the % F	Tree stratum (dbh : with > 60% tree cc or non-maintained une located within the located w	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each r  100%  1.1  100%  1.2  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. (	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Field behin bank within buffer has clearcut/log 25ft have to and non m understory	n riparian been gged. First ee cover aintained	CI 1.1:
Riparian Buffers  Condition Scores  Delineate ripe lescriptors. Determine sceletw. Enter the % f Right Bank  Left Bank  Left Bank  INSTREA	Tree stratum (dbh : with > 60% tree ca non-maintained un located within th located within th located within th strain areas along quare footage for e Riparian Area and % Riparian Area > Score > M HABITAT: Varoot mats; SAV: r	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5  each stream ban each by measurin  Score for each r  100%  1.1  100%  1.2  aried substrate si iffle poole complete.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable feature	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	ts of length & wide  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Field behin bank within buffer has clearcut/lo 25ft have to and non m understory  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	n riparian been gged. First ee cover aintained	
Riparian Buffers  Condition Scores  Delineate ripelescriptors Determine scelow Enter the % F	Tree stratum (dbh : with > 60% tree conon-maintained und located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each r 100% 1.1  100% 1.2  aried substrate si iffle poole completimal	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo Stable habitat elei	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. ( In the blocks below  ty and depths; wo res.  Conditiona ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the second of the second	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substrations are typically ments are typically ments are typically ments are typically ments are typically processed to the substration of the	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  Blocks en  High  Deliver to the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Field behin bank within buffer has clearcut/lo 25ft have to and non m understory  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	n riparian been gged. First ee cover aintained	
Riparian Buffers  Condition Scores  Delineate ripe lescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  B. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh : with > 60% tree conon-maintained und located within the located withi	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5  each stream ban each by measurin  Score for each r  100%  1.1  100%  1.2  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) resent, with 30% resent, with 3	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you  pris; stable substr	ts of length & wide  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Field behin bank within buffer has clearcut/lo 25ft have to and non m understory  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	n riparian been gged. First ee cover aintained	

Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX	VA	R4SB	02080106	12/9/2015	04-STR-48			
	CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, nbankments, spoil piles, constrictions, livestock  Conditional Category								
	Negligible	Mi	nor		erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	Greater than 8 disrupted by an alterations listed guidelines AND/0	30% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or nent.		
				recovered.	recovered.				

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View downstreasm Top Right View downstream Bottom Left: Iron oxidizing bacterial Bottom Right: View of stream

NC DWQ Stream Identification Form Version 4.11

04-STR-48

Date: 12/9/2015	Project/Site: DC2RVA - Area 04	Latitude: 37.904125
Evaluator: J. Budnik, M. Rockwell	County: Caroline County	Longitude: -77.466761
<b>Total Points:</b> 26.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 10  1a. Continuity of channel bed and bank  2. Sinuosity of channel along thalweg  3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence  4. Particle size of stream substrate	0 0 0 0	Weak  1 1 1	Moderate 2	<b>Strong</b> 3 3	
1 <sup>a.</sup> Continuity of channel bed and bank     2. Sinuosity of channel along thalweg     3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence     4. Particle size of stream substrate	0 0	1	2	3	
Sinuosity of channel along thalweg     In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence     Particle size of stream substrate	0 0	1	2	_	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence     Particle size of stream substrate	0	<u> </u>	$\rightarrow$	3	
ripple-pool sequence 4. Particle size of stream substrate	-	1			
	0		2	3	
		(1)	2	3	
5. Active/relict floodplain	0		2	3	
6. Depositional bars or benches	0	(1)	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts		1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	( No	0 = 0	Yes = 3		
artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = 7)					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	0	(1)	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	No	0 = 0	Yes = 3		
C. Biology (Subtotal = $9.5$ )					
18. Fibrous roots in streambed	3	(2)	1	0	
19. Rooted upland plants in streambed	3	(2)	1	0	
20. Macrobenthos (note diversity and abundance)	٥	(T)	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	0	0.5	1_	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5		1.5	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

26. Wetland plants in streambed

Notes: Stream is located in a small valley and originates in a nearby field. Debris lines are very small. Field Sheet 12-STR-03 Team A.

FACW = 0.75 OBL = 1.5 Other = 0

wetland plants Sketch: me slight debris

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	04	VA	R2SB	02080106	12/9/2015				
	e(s) of Evalua	. ,	Stream Nam	e and Informa							
	dnik, M. Roc						orth Anna	a River)			
Channel C	Condition: Asse	ess the cross-sec	tion of the stream		ondition (erosion, conditional Categorial						
	Opt	imal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	-	W W	T			less than Severe or	Overwidend		1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point barsa are present. Acce floodplain or fully	n or natural rock, 100%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	ew areas of active cted banks. Majority table (60-80%). ition or natural rock-80%) AND/OR ures contribute to likfull and low flow Il defined. Stream to bankfull benches, d floodplains along	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe ewer bank slopes. seent on 40-60% of tative protection on Streambanks may creut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	Vertically/laterally viden further. Maj are near vertical. E 60-80% of banl protection prese banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrik AND/OR V-shape	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	Deeply incised vertical/lateral in: incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank slc Erosion/raw ban	stability. Severe tained within the do below average hajority of banks ut. Vegetative on less than 20% of venting erosion. Dughing present. ks on 80-100%.	
		on covers less than	sediment cover	each. Transient s 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protection 40% of the bar	on is present on > aks and stable	have AND/OR Aggrading channel. Great than 80% of stream bed is covered deposition, contributing to instability		CI
Score	;	3	2	.4	:	2	1.	6	1		2.4
RIPARIAI	N BUFFERS: /	Assess both bank	's 100 foot riparia	in areas along the	e entire SAR. (ro	igh measuremen			itable)		
				ditional Cate	gory				NOTES>>		
Riparian Buffers	Tree stratum (dbh: with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed	NOTES>> Right bank road prese 100 ft.		
•	Tree stratum (dbh : with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	Suboj  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Right bank road prese 100 ft.		
Buffers	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	> 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both abrub layers or a non-maintained understory.  High	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">30% tree canopy cover.</a> High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Right bank road prese 100 ft.		
Condition Scores  Delineate rip: escriptors. Determine so	Tree stratum (dbh: with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.	Suboy  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Kinto Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Right bank road prese 100 ft.		
Condition Scores  Delineate rips scriptors. Determine scolow. Enter the % I	Tree stratum (dbh: with > 60% tree or non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	> 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  .5  each stream ban each by measurin Score for each ri	Suboy  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Kinto Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Right bank road prese 100 ft.		
Condition Scores  Delineate rip: scriptors. Determine sclow. Enter the % I	Tree stratum (dbh: with > 60% tree or non-maintained un located within th  1. arian areas along quare footage for e	> 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5.5 each stream ban each by measurin	Suboy  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Kinto Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums iparian qual 100	NOTES>> Right bank road prese 100 ft.	nt within	
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Condition Scores  Delineate rippescriptors. Determine scolow. Enter the % I Right Bank  Left Bank  INSTREAL indercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cz non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Vi root mats; SAV; r  Opti Habitat elements a in greater than 5	> 3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  -5  -5  -6  -6  -6  -6  -7  -7  -7  -7  -7  -7	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both charbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subol Stable habitat elei present in 30-509 are adequate fo popul	Low Suboptimal Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  ategories and Co nothe blocks below the blocks below y and depths; wo res. Conditiona ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substrations are typically ments are typically ments are typically ments are typically ments are typically carse are supported to the substration of the substrati	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks end Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%  100%  Interview of the comparable conditions.	NOTES>> Right bank road prese 100 ft.  Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl > NOTES>>	nt within	

Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02080106	12/9/2015	04-STR-49		
	ANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, nents, spoil piles, constrictions, livestock  Conditional Category  NOTES>> Road on right bank,								
	Negligible	Mi	nor				ilroad bridge and		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	disrupted by any alterations listed guidelines AND/C	30% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or	interstate o	cross river.
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0 CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: View of floodplain with railroad bridge to the top right Top Right: View of North Anna River and roadway under railroad bridge Bottom Left: View of culvert carrying STR01 joining the North Anna River Bottom Right: View of North Anna River from under railroad bridge

NC DWQ Stream Identification Form Version 4.11 North Anna River 04-STR-49

	51011 1111	
Date: 12/9/2015	Project/Site: DC2RVA - Area 04	Latitude: 37.888414
Evaluator: J. Budnik, M. Rockwell	County: Caroline County	Longitude: -77.462211
<b>Total Points:</b> 55.5 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = $\frac{25}{2}$ )	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	2	(3)
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence	U	ı		
Particle size of stream substrate	0	1	2	<u>(3)</u>
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	11	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	= 0	Yes	= 3
a artificial ditches are not rated; see discussions in manual	•			
B. Hydrology (Subtotal = $12.5$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes:	= 3
C. Biology (Subtotal = 18 )	_			
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	<del>  8</del>	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	(3)
21. Aquatic Mollusks	0	1	2	(3)
22. Fish	0	0.5	1	(1.5)
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	7.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method	ds. See p. 35 of manual			
Notes: River strong flow with steep banks at area			North Anna River	Team A.
المقاملات	culvert			
Sketch:	debri	S		
bridge	N. Comment			
17	1			
/ /				
	71	11:1000		
/ /	1 + d	rainage		
1. 1	11			

				fied Stream N						
5		Dunings Mana		wadeable chan	nels classified a Cowardin			045."	Impact/SAR	Impact
Project #		Project Name		Locality	Class.	HUC	Date	SAR#	length	Factor
N/A		2RVA - Area		VA	R2SB3	02080106	12/9/2015			
	e(s) of Evalua udnik, M. Roc	. ,	Stream Nam	e and Informa	ation	04-S	ΓR-50			
	Condition: Asse		tion of the stream	and prevailing o	andition (erasion		111-30			
Onamici				C	Conditional Catego	ry	Do		Cou	
	Opti	ımaı	Subo	ptimal	Iviar	ginal	Po	or	Sev	ere
	1	Who have	Clintal in its and 4			less than Severe or stable than Severe	Overwiden Vertically/laterally		1	5
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches.	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow all defined. Stream o bankfull benches, to floodplains along	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran	swer bank slopes. esent on 40-60% of lative protection on Streambanks may rcut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Maj	ority of both banks rosion present on its. Vegetative on 20-40% of fficient to prevent its 60-80% of the id by sediment.	Deeply incised vertical/lateral in: incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank slc Erosion/raw ban	stability. Severe itained within the ad below average najority of banks ut. Vegetative on less than 20% of eventing erosion. oughing present.
	and transverse be sediment deposition 10% of	on covers less than	portions of the r sediment cover	reach. Transient rs 10-40% of the bottom.	stability, may be AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the onal features which to stability.	AND/OR V-shape vegetative protecti 40% of the bar sediment depos	on is present on > ks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	g channel. Greater bed is covered by uting to instability. channels and/or
Score		3		2.4	I	2	1.		1	
			•		Sheet 12-	•		e unstabl	seument.	nanover.
. RIPARIAI	N BUFFERS: A	Assess both bank	s's 100 foot riparia	Field	d Sheet 12-	STR-01 d,T	eam.		table)	nanover.
. RIPARIAI	N BUFFERS: A		c's 100 foot riparia	Field	e entire SAR. (ro	STR-01 d,T	eam.	h may be accep	table)	
RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Field an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	e entire SAR. (ro gory  Mar  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hap production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	table)	
Riparian Buffers	Option  Tree stratum (dbh with > 60% tree canon-maintained und	imal  > 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Field an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	e entire SAR. (rogory  Mar  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	notes>> Near Wetla	
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine so	Tree stratum (dbh with > 60% tree conon-maintained un located within the located within t	imal  3 inches) present, anopy cover and a derstory. Wetlands er iparian areas.  5 each stream ban areach by measuring	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Field an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Covength and width. Covength and width.	e entire SAR. (ro gory  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  andition Scores us Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	eam.  Its of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	notes>> Near Wetla	
Condition Scores Delineate ripescriptors. Determine scelow. Enter the %	Tree stratum (dbh : with > 60% tree cc non-maintained una located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin Score for each r 100% 1.2	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Field an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Covength and width. Covength and width.	e entire SAR. (ro gory  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  andition Scores us Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	eam.  ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt  of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed loits, trails, or other comparable conditions.  Low 0.5  Le sums imparian qual 100 100%	NOTES>> Near Wetla boundary.	nd 2
Condition Scores Delineate ripescriptors. Determine scelow. Enter the %	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands er iparian areas.  5  each stream ban each by measurin Score for each r 100% 1.2	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Field an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Covength and width. Covength and width.	e entire SAR. (ro gory  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  andition Scores us Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	eam.  ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt  of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Near Wetla boundary.  Cl= (Sum % RA * Si Rt Bank Cl >	nd 2  cores*0.01)/2  1.20
Condition Scores Delineate rip escriptors. Determine solow. Enter the % Right Bank Left Bank Left Bank INSTREAI ndercut banks; Instream Habitat/	Tree stratum (dbh : with > 60% tree cc non-maintained una located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5.5  each stream ban each by measuring Score for each race of the stream ban l	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocii exes, stable featu	Field an areas along the ditional Categories and congettinal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Coungth and width. Coungth and depths; wo res.  Conditional	e entire SAR. (ro gory  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are province.  Calculators are province.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with aniatianed understory.  Low  0.75  sing the povided for you  pris; stable substr	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt  of % R Blocks et  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	NOTES>> Near Wetla boundary.	nd 2  cores*0.01)/2  1.20  1.20  nge algae present.
Condition Scores  Delineate rip escriptors. Determine scelow. Enter the %  Right Bank  Left Bank  INSTREAL	Tree stratum (dbh : with > 60% tree cc conon-maintained und located within the located wi	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5.5  each stream ban each by measuring some for each reach to the stream ban 1.2  100%  1.2  arried substrate siffle poole completimal  re typically present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	Field an areas along the ditional Categories ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Co ongth and width. Co on the blocks below  ty and depths; wo res.  Conditional	e entire SAR. (ro gory  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (shot) s inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are present, with Stable habitat elepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , tree <a href="#square">5 inches</a> present, with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> , with <a href="#square">3 inches) present</a> ,	ts of length & widt  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	Cl= (Sum % RA * Si Rt Bank Cl > Lt Bank Cl > Bright orar	nd 2  cores*0.01)/2  1.20  1.20  nge algae present. instream

	St	ream In	npact A	ssessm	ent Fo	rm Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB3	02080106	12/9/2015	04-STR-50		
	L ALTERATION: Stream cross poil piles, constrictions, livestock	sings, riprap, conc	rete, gabions, or		straightening of cl	hannel, channeliz	zation,	NOTES>>	
	Negligible	Mir	nor		erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	Greater than 8 disrupted by an alterations listed guidelines AND/0	30% of reach is y of the channel in the parameter DR 80% of banks blion, riprap, or nent.		
				recovered.	recovered.				

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: View downstream toward culvert under access road Top Right: View downstream toward culvert under access road Bottom Left: Typical view upstream Bottom Right: Typical view upstream

Project/Site: DC2RVA - Area 04

### NC DWQ Stream Identification Form Version 4.11

Date:

04-STR-50

Latitude:

<b>Total Points:</b> 0 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one ermitten Perenni		
n = 10 or poronnar n = 00				
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual	•		•	
B. Hydrology (Subtotal =)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	o = 0	Yes:	= 3
C. Biology (Subtotal =)	<u> </u>			
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other met	hods. See p. 35 of manua	al.		
Notes: NC data for this resource not available (	no field sheets).			
Sketch:				

		Stre			sment Methodology f		<b>) (For</b> i	m 1)			
				wadeable chan	nels classified a	s intermittent or	perennial		Impact/SAR	Impact	
Project #	ı	Project Name	•	Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A		2RVA - Area		VA	R2SB	02080106	12/9/2015				
	e(s) of Evaluat dnik, M. Roc		Stream Nam	e and Informa	ation	04-ST	D 510				
			ti				K-51a				
. Channel C	ondition: Asse			С	Conditional Catego	ry			1 0		
	Opti	maı	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	The state of the s	AND AND AND AND AND AND AND AND AND AND	Slightly incised, for	ew areas of active	Poor. Banks more	less than Severe or stable than Severe	Overwidene Vertically/laterally u	ınstable. Likely to	Deeply incised	(or excavated).	
Channel Condition	Very little incision of 100% stable bar surface protectior prominent (80-11 Stable point bars/l are present. Acce floodplain or fully bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 20%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars, irs few. Transient	of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient	Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sediment. Sediment. Sediment. Sediment. Sediment. Depositiv. Depositiv.	wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Majc are near vertical. E 60-80% of banh protection preser banks, and is insul erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	rosion present on as. Vegetative on 20-40% of fficient to prevent a 60-80% of the d by sediment. orary/transient in uting to instability.	vertical/lateral in incision, flow con banks. Streambe rooting depth, rr vertical/underc protection present c banks, is not pre Obvious bank sle Erosion/raw ban AND/OR Aggradin	stability. Severe tained within the dd below average ajority of banks ut. Vegetative in less than 20% of venting erosion. bughing present. ks on 80-100%.	
	sediment depositio 10% of I		sediment cover	s 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protection 40% of the band sediment depos	ks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	CI
Score	3	1	2	.4		2	1.	6	1		2.4
NOTES>>				Hanover, F	Field Sheet	12-STR-01	C.Team A.				
	N BUFFERS: A	ssess both bank	's 100 foot riparia	an areas along the				h may be accep	table)		
			c's 100 foot riparia	an areas along the	e entire SAR. (roi	ugh measuremen	ts of length & widt		NOTES>>		
	Opti  Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a derstory. Wetlands	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the	e entire SAR. (roi			or	NOTES>> Right bank toward rail is vegetate	road, but	
RIPARIAN Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a derstory. Wetlands	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	e entire SAR. (roi gory  Mary  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> Right bank toward rail is vegetate	road, but	
RIPARIAN Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a letrestory. Weltands a riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po- High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Right bank toward rail is vegetate	road, but	
Riparian Buffers  Condition Scores Delineate ripaescriptors. Determine scorelow.	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	mal  3 inches) present, nopy cover and a leastory. Wetlands a riparian areas.	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2	can areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Right bank toward rail is vegetate	road, but	
Riparian Buffers  Condition Scores Delineate ripasscriptors. Determine scolow. Enter the % F	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the	mal  3 inches) present, nopy cover and a lerstory. Wetlands e riparian areas.	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2	can areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % Ri	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Right bank toward rail is vegetate	road, but	
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Riparian Buffers  Condition Scores Delineate ripasscriptors. Determine scolow. Enter the % F	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	mal  3 inches) present, nopy cover and a letrstory. Weltands e riparian areas.	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2	can areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % Ri	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Right bank toward rail is vegetate	road, but	<u>CI</u> 1.20
Riparian Buffers  Condition Scores Delineate ripasscriptors. Determine scolow. Enter the % fi	Tree stratum (dbh > with > 60% tree canon-maintained uncolocated within the located withi	mal  3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.  5  each stream ban ach by measurin  100%  1.2  100%  1.2  arried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in	an areas along the ditional Categories and Council Categories and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, nurseries; conditized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks ec	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Right bank toward rail is vegetate  Cl= (Sum % RA * S Rt Bank Cl >	cores*0.01)/2	
Riparian Buffers  Condition Scores Delineate ripaescriptors. Determine scelow. Enter the % f Right Bank Left Bank INSTREAI	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	mal  3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.  5  sach stream ban ach by measurin 100% 1.2 100% 1.2 uried substrate siffle poole complete.	Con Subo Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable features	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. (dense the blocks below the bloc	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High  0.85  Calculators are provided to the condition of the condition	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks ed.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, conditions.  Low 0.5  Low 10.5	NOTES>> Right bank toward rail is vegetate  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2	
Riparian Buffers  Condition Scores Delireate ripe escriptors. Determine scelow. Enter the % F Right Bank  Left Bank Left Bank INSTREAI ndercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	mal  3 inches) present, nopy cover and a leterstory. Wetlands riparian areas.  5  beach stream ban ach by measurin 100% 1.2  100% 1.2  aried substrate si ffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo Stable habitat elei	an areas along the ditional Categories and Coungth and width. Categories and Coungth and Categories and Categ	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prove.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks econds and stabilized	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%	NOTES>> Right bank toward rail is vegetate  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2	
Condition Scores  Delineate ripe escriptors Determine so elow Enter the % f Right Bank  Left Bank  INSTREAI ndercut banks;	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	mal  3 inches) present, nopy cover and a terstory. Wetlands riparian areas.  5  ach stream ban ach by measurin 100% 1.2 100% 1.2 arried substrate si fffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Categorithmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Coungth and width. Coungth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  100%  100%  100%	NOTES>> Right bank toward rail is vegetate  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	cores*0.01)/2	

	St	ream In	npact A	ssessm	ent Fo	rm Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	csx		VA	R2SB	02080106	12/9/2015	04-STR-51a		
	L ALTERATION: Stream cross poil piles, constrictions, livestock	sings, riprap, conc	rete, gabions, or		straightening of cl	hannel, channeliz	zation,	NOTES>>	
	Negligible	Mir	nor		erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: Typical view of stream through wetland Top Right: View of stream with iron oxidizing bacteria Bottom Left: Typical view of stream

Bottom Right: Typical view of stream

NC DWQ Stream Identification Form Version 4.11

04-STR-51a

Date: 12/9/2015	Project/Site: DC2RVA - Area 04	Latitude: 37.885333
Evaluator: J. Budnik, M. Rockwell	County: Hanover County	Longitude: -77.461358
<b>Total Points:</b> 39 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 19.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	2	(3)
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	(3)
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	2	(3)
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	(N	0 = 0	Yes =	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 11.5				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5		1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	o = 0	Yes =	= 3
C. Biology (Subtotal = 8				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other methods. \$	•			
Notes: Portion of stream flows through wetland. Prob	oably also rece	ives seep water. I	Field Sheet 12-STF	R-01-C Team
A.				
Sketch:  depositional bar  deposition  vegetated depositional sand	epositional bar	positional		

		Stre		ssess			-	m 1)			
				fied Stream N wadeable chan							
Project #	1	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area	-	VA	R2SB3	02080106	12/9/2015				
	ne(s) of Evalua udnik, M. Roc		Stream Nam	e and Informa	ation	04.01	D 54h				
	Condition: Asse		tion of the stream	n and prevailing co	ondition (erosion.	04-ST	K-SID				
	Opti				onditional Catego		Po	or	Sev	rere	
	1	LANGE OF THE PARTY	1			less than Severe or	Overwiden		1	5	
Channel Condition	Very little incision o 100% stable bai surface protectio prominent (80-1 Stable point bars' are present. Acce floodplain or fully bankfull benches. and transverse basediment depositio	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ess to their original of developed wide Mid-channel bars, ars few. Transient	erosion or unproter of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to or newly develope portions of the r	ew areas of active ted banks. Majority table (60-80%), tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow ill defined. Stream o bankfull benches, df loodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositiv stability, may be	esent on 40-60% of tative protection on Streambanks may trcut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	Vertically/laterally widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is inst erosion. AND/OI stream is coverr Sediment is temp nature, and contril AND/OR V-shapi	ority of both banks crosion present on ks. Vegetative nt on 20-40% of ffficient to prevent R 60-80% of the ab ysediment, orary/transient in puting to instability, ad channels have	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious bank sle Erosion/raw bank	eut. Vegetative on less than 20% of eventing erosion. oughing present.	
	10% of			rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protecti 40% of the bar sediment depor	ks and stable	than 80% of stream deposition, contrib Multiple thread subterran	channels and/or	CI
Score	3	3	2	2.4	:	2	1.	6	1	I	1.6
NOTES>>				Hanover.	Field Shee	t 12-STR-0	1 Team A.				
. RIPARIAI	N BUFFERS: A	Assess both bank	s's 100 foot riparia		e entire SAR. (ro			h may be accep	table)		
. RIPARIAI			Con	an areas along the	gory	ugh measuremen	ts of length & wid		NOTES>>		
RIPARIAI Riparian Buffers	Option  Tree stratum (dbh : with > 60% tree cc	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree		Or  Low Poor:		nk ly adjacent am, but llast is	
Riparian	Option  Tree stratum (dbh with > 60% tree canon-maintained und	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropiand; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> Vegetation on right ba immediate to the strea railroad ba essentially	nk ly adjacent am, but llast is	
Riparian Buffers	Option  Tree stratum (dbh with > 60% tree canon-maintained und	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropiand; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> Vegetation on right ba immediate to the strea railroad ba essentially	nk ly adjacent am, but llast is	
Riparian Buffers	Option  Tree stratum (dbh with > 60% tree canon-maintained und	imal  3 inches) present, anopy cover and a destroyr. Wellands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Vegetation on right ba immediate to the strea railroad ba essentially	nk ly adjacent am, but llast is	
Riparian Buffers  Condition Scores  Delineate rip: escriptors. Determine scelow.	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a deferstory. Weltands e riparian areas.  5.5  each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutvoer (dense vegetation).  Low  1.1  Categories and Coungth and width. Coungth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums iparian qual 100	NOTES>> Vegetation on right ba immediate to the strea railroad ba essentially	nk ly adjacent am, but llast is	
Riparian Buffers  Condition Scores  Delineate rips Secriptors. Determine Scolow. Enter the % I	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a defestory. Wellands e riparian areas.  5  each stream ban each stream ban each by measurin Score for each ri 100%	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutvoer (dense vegetation).  Low  1.1  Categories and Coungth and width. Coungth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Vegetation on right ba immediate to the strea railroad ba essentially	nk ly adjacent am, but llast is	
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Condition Scores  Delineate rip- sescriptors. Determine scelow. Enter the % I	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	imal  3 inches) present, anopy cover and a dierstory. Wetlands er riparian areas.  5  each stream ban each by measurin  100%  1.1  aried substrate si fiftle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coongth and width. (con the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <20% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Vegetation on right ba immediate to the strea railroad ba essentially bank.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	ink ly adjacent am, but llast is the right	
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Condition Scores  Delineate ripesscriptors. Determine Scelow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/ Available	Tree stratum (dbh with > 60% tree canon-maintained una located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands er fiparian areas.  5  each stream ban each by measurin  100%  1.1  aried substrate si fiftle poole completimal  re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (dense the blocks below  ty and depths; wo res.  Conditiona ptimal ments are typically % of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically 6 of the reach and	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e  Habitat elements lacking or are un	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Vegetation on right ba immediate to the strea railroad ba essentially bank.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	ink ly adjacent am, but llast is the right	0.85
Riparian Buffers  Condition Scores Delineate ripescriptors Determine scelow Enter the % I	Tree stratum (dbh : with > 60% tree cc non-maintained un located within th  1. carian areas along a quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Va ; root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin 100% 0.6 100% 1.1 aried substrate si iffle poole completimal re typically present 0% of the reach.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Count the blocks below ty and depths; wo res.  Conditional primal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr ginal ments are typically	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%  100%	NOTES>> Vegetation on right ba immediate to the strea railroad ba essentially bank.  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	ink ly adjacent am, but llast is the right	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor N/A CSX R2SB3 02080106 12/9/2015 04-STR-51b 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Rip-rap present in one section, also Negligible Minor Severe railroad ballast 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by an of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed i srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. CI 0.5 SCORE 1.5 1.3 1.1 0.9 0.7 0.90 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole num

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: Typical view of stream Top Right: Typical view of stream along railroad Bottom Left: Typical view of stream along railroad Bottom Right: Typical view of stream along railroad

Project/Site: DC2RVA - Area 04

NC DWQ Stream Identification Form Version 4.11

Date: 12/9/2015

04-STR-51b

Latitude: 37.884133

Evaluator: J. Budnik, M. Rockwell	County: Hanove	er County	Longitude: -77	7.460922
<b>Fotal Points:</b> 39 Stream is at least intermittent	Stream Determi	nation (circle on	e) Other	
if $\geq 19$ or perennial if $\geq 30^*$	Ephemeral Inte	rmitten Perenni	e.g. Quad Name:	
•			·	
A. Geomorphology (Subtotal = 19.5	Absent	Weak	Moderate	Strong
<sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	2	(3)
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	(3)
7. Recent alluvial deposits	0	(1)	2	3
B. Headcuts	0	1	2	(3)
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 11.5)			_	
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	2	(3)
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5		1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 8 )	·			
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	<u>0.</u> 5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed			OBL = 1.5 Other = 0	
*perennial streams may also be identified using other meth	nods. See p. 35 of manua	ıl.		
Notes: This sheet is missing-filled out this NC fo	orm using data from	Field Sheet 12-S	STR-01-C Team A,	same stream
<u> </u>	<u> </u>		<b>,</b>	
Sketch:				

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
Droinet#		Project Name		wadeable chan	nels classified a	s intermittent or		CAD#	Impact/SAR	Impact	
Project #		-			Class.		Date	SAR #	length	Factor	
N/A Name	e(s) of Evaluat	c2RVA - Area		VA e and Informa	R4SB ation	02080106	12/9/2015				
	dnik, M. Roc					04-ST	R-51c				
. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opti	imal	Subo	ptimal c	Conditional Categor	y ginal	Po	or	Sev	ere	
		AND PARK	1		Often incised, but I	ess than Severe or	Overwidene	ed/incised.	1	5	
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	ew areas of active toted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, difloodplains along reach. Transient	or Poor due to lo Erosion may be pre both banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sed temporary/tran- instability. Depositic	stable than Severe wer bank slopes, seent on 40-60% of ative protection on Streambanks may rcut. AND/OR 40- his covered by diment may be sient, contribute on that contribute to forming/present.	Vertically/laterally is widen further. Maja are near vertical. E 60-80% of bank protection preset banks, and is insulerosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the d by sediment. orary/transient in uting to instability.	Deeply incised vertical/lateral in incision, flow con banks. Streambe rooting depth, revertical/lunderc protection present of banks, is not pre Obvious bank sk Erosion/raw ban AND/OR Aggradin.	stability. Severe tained within the do below average lajority of banks ut. Vegetative in less than 20% of venting erosion. Sughing present. ks on 80-100%.	
	sediment depositio	on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	AND/OR V-shape vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protection 40% of the bard sediment depos	ks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	.4	1	2	1.	6	1		1.0
NOTES>>	N BUFFERS: A	Deeply in									
	N BUFFERS: A	Assess both bank	c's 100 foot riparia		e entire SAR. (rou	ugh measuremen		h may be accep		left bank.	
	Opti Tree stratum (dbh > with > 60% tree ca	Assess both bank  imal  > 3 inches) present, aderstory. Wetlands	Con Suborting High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the	e entire SAR. (rou	ugh measuremen	ts of length & widt	Low Poor: Impervious surfaces, mine spoil lands denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Within the 100ft area i and indust activity. Im area has so and shrub Right bank and shrub adjacent, tl railroad dit	s lawns rial mediate some tree layer. has tree layer	
RIPARIAN Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	Assess both bank  imal  > 3 inches) present, aderstory. Wetlands	Con Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Within the 100ft area i and indust activity. Im area has so and shrub Right bank and shrub adjacent, ti	s lawns rial mediate some tree layer. has tree layer	
. RIPARIAN	Opti Tree stratum (dbh > with > 60% tree ca	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	C's 100 foot riparia  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other corngrable conditions.	NOTES>> Within the 100ft area i and indust activity. Im area has so and shrub Right bank and shrub adjacent, tl railroad dit	s lawns rial mediate some tree layer. has tree layer	
Riparian Buffers  Condition Scores  Delineate rips descriptors. Determine squelow. B. Enter the % F	Opti Tree stratum (dbh > with > 60% tree cc non-maintained und located within the	Assess both bank imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (displayed)	High Marginal: Non-maintained, dense herbaceous wegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Within the 100ft area i and indust activity. Im area has so and shrub Right bank and shrub adjacent, tl railroad dit	s lawns rial mediate some tree layer. has tree layer	
Riparian Buffers  Condition Scores  Delineate ripa escriptors. Determine seletow.	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	Assess both bank imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (displayed)	High Marginal: Non-maintained, dense herbaceous wegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums parian qual 100	NOTES>> Within the 100ft area i and indust activity. Im area has s and shrub Right bank and shrub adjacent, tl railroad dit railroad.	s lawns rial mediate some tree layer. has tree layer nen ch and	
Riparian Buffers  Condition Scores  Delineate ripa escriptors. Determine squelow. Enter the % F	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	Assess both bank imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (displayed)	High Marginal: Non-maintained, dense herbaceous wegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums parian qual 100	NOTES>> Within the 100ft area i and indust activity. Im area has so and shrub Right bank and shrub adjacent, tl railroad dit	s lawns rial mediate some tree layer. has tree layer nen ch and	CI
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine squelow. Enter the % F Right Bank  Left Bank	Tree stratum (dbh > with > 60% tree oc non-maintained und located within the located with	Assess both bank imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bank each by measurin Score for each ri 100% 0.85	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (an the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are proven.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  ing the povided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies a supplication of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Le sums imparian qual 100 100%	NOTES>> Within the 100ft area i and indust activity. Im area has sa and shrub Right bank and shrub adjacent, the railroad dit railroad.	s lawns rial mediate some tree layer. has tree layer hen ch and	CI 0.73
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Condition Scores  Delineate rips descriptors. Deltermine squelow. Enter the % F Right Bank  Left Bank  Instream Habitat/	Tree stratum (dbh > with > 60% tree oc non-maintained und located within the located with	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bank each by measurin  Score for each ri  100%  0.85  100%  0.6  aried substrate si iffle poole completimal	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo Stable habitat elei	an areas along the ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbin > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (an the blocks below the blocks below the blocks below the ptimal ments are typically ments are typically ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree canopy cover with maintained understory.  Low  0.75  ing the povided for you	ts of length & widt  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ed  Blocks ed  High  High  Blocks ed  Blocks ed  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Within the 100ft area is and indust activity. Im area has so and shrub Right bank and shrub adjacent, ti railroad dit railroad.  Cl= (Sum % RA * S Rt Bank Cl> Lt Bank Cl> NOTES>>	s lawns rial mediate some tree layer. has tree layer nen ch and	
Riparian Buffers  Condition Scores  Delineate ripa descriptors. Determine so pelow. Right Bank  Left Bank  B. INSTREAN undercut banks; Instream	Tree stratum (dbh > with > 60% tree oc non-maintained und located within the located with	Assess both bank  imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream bank each by measurin 100% 0.85  100% 0.6 aried substrate si iffle poole completimal are typically present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below the blocks below the blocks below the conditional ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the povided for you  pris; stable substr	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, orther comparable condition.  High  0.6  Ensure the of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Within the 100ft area is and indust activity. Im area has so and shrub Right bank and shrub adjacent, ti railroad dit railroad.  Cl= (Sum % RA * S Rt Bank CI > Lt Bank CI > Drains stor	s lawns rial mediate some tree layer. has tree layer nen ch and	

	St	ream In	npact A	ssessm	ent Fo	rm Pag	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB	02080106	12/9/2015	04-STR-51c		
	L ALTERATION: Stream cross spoil piles, constrictions, livestock	sings, riprap, conc	rete, gabions, or		straightening of cl	hannel, channeliz	zation,	NOTES>>	
	Negligible	Mir	nor		erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	30% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or nent.		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: Typical view toward railroad Top Right: Typical view of stream as it nears railroad and turns north Bottom Left: Typical view upstream, away from railroad

Bottom Right: Sheen from iron oxidizing bacteria

NC DWQ Stream Identification Form Version 4.11

04-STR-51c

ate: 12/9/2015	Project/Site: DC2RVA - Area 04	Latitude: 37.883075
valuator: J. Budnik, M. Rockwell	County: Hanover County	Longitude: -77.460569
otal Points: 26 tream is at least intermittent ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:
tream is at least intermittent		

A. Geomorphology (Subtotal = 14	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	9	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	(No	= 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 7.5)				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	(1.5)
17. Soil-based evidence of high water table?	No	= 0	Yes:	= 3
C. Biology (Subtotal = 4.5)				
18. Fibrous roots in streambed	3	2	1	(0)
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Water has a sheen, possible pollutants. Field Sheet 12-STR-01 Team A.

Sketch:

bar

debris

debris

		Stre					(For	m 1)			
					lethodology f						
Project #		Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	04	VA	R2SB	02080106	2/1/2016				
Name	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
J. B	udnik, K. As	troth			04	-STR-5	2 (Bull R	un)			
1. Channel C	ondition: Asse	ess the cross-sec	tion of the stream	and prevailing c	ondition (erosion,	aggradation)					
	Opti	imal	Subo	ptimal		ginal	Po	or	Sev	ere	
		AND PARKET			Often incised, but I	less than Severe or	Overwiden	ed/incised.	1	5	
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches.	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to	ew areas of active cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to akfull and low flow II defined. Stream o bankfull benches, d floodplains along	or Poor due to lo Erosion may be pro both banks. Veget 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran	stable than Severe ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Maj	ority of both banks rosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. orary/transient in	Deeply incised of vertical/lateral incision, flow con banks. Streambe rooting depth, m vertical/undercorrotection present of banks, is not pre Obvious bank sic	stability. Severe tained within the d below average ajority of banks ut. Vegetative in less than 20% of venting erosion. Bughing present.	
	and transverse be sediment deposition 10% of	on covers less than	portions of the r sediment cover	reach. Transient s 10-40% of the bottom.	stability, may be AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the ional features which to stability.	AND/OR V-shape vegetative protecti 40% of the bar	ed channels have on is present on > nks and stable	Erosion/raw ban AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	g channel. Greater bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	.4	:	2	1.	6	1		2.4
NOTES>>	I BUFFERS: /	Aggagg both bond	do 100 foot riporio		ield Sheet			th may be seen	table)		
Z. KIPAKIAI	BUFFERS. F	Assess both bank		ditional Cate		ugn measuremen	its of length & wid	in may be accep	NOTES>>		
	Opti	imal		ptimal		ginal	Po	or	Pipeline co	rridor	
Riparian Buffers	with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, regarding shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (4bh > 3 inches) present, with <a href="#">400%</a> tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.		cuts across Stream run to pipeline yards befor to east into	s stream. s parallel for 50-75 re turning	
			High	Low	High	Low	High	Low			
Condition Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
descriptors. 2. Determine sq pelow.	arian areas along uare footage for e Riparian Area and	each by measurin	g or estimating le	ngth and width. (	Calculators are pr		Ensure t of % R Blocks e	iparian qual 100			
Right Bank	% Riparian Area>	20% 0.6	80% 1.5					100%			
1.05	% Riparian Area>	80%	20%					100%	CI= (Sum % RA * So Rt Bank CI >	cores*0.01)/2	CI
Left Bank	Score >	0.6	1.5						Lt Bank CI >	0.78	1.0
	// HABITAT: Va				ody and leafy deb	oris; stable substr	ate; low embeded	lness; shade;	NOTES>>		
Instream			1	Conditiona							
Habitat/	Opti	imal		ptimal ments are typically		ginal ments are typically	Po Habitat elements				
Available Cover	Habitat elements a in greater than 5	re typically present 0% of the reach.	present in 30-50% are adequate fo	% of the reach and r maintenance of	present in 10-30% are adequate fo	% of the reach and r maintenance of	lacking or are un elements are typic	nstable. Habitat ally present in less			
Score	1.		popul	ations.	popul	ations.	than 10% o	f the reach.			CI 1.2
JUJIE	<u> </u>						ı U.		I		1.2

	Stream Impact Assessment Form Page 2								
Project#	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX	VA	R2SB	02080106	2/1/2016	04-STR-52			
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock									
	Conditional Category    Negligible   Minor   Moderate   Severe								
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	30% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or nent.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH C	ONDITION II	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IIS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: Typical view of stream
Top Right: Typical view of stream
Bottom Left: View of pipeline ROW and Culvert 01 under railroad, concrete 8 feet
Bottom Right: View of stream away from railroad and gasline ROW

NC DWQ Stream Identification Form Version 4.11

**Bull Run** 

04-STR-52

<b>Date:</b> 2/1/2016	Project/Site: DC	2RVA - Area 04	Latitude: 37.87	74373
Evaluator: J. Budnik, K. Astroth	County: Hanove	er County	Longitude: -77	.459231
<b>Total Points:</b> 38 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one rmitten Perenni		
A. Geomorphology (Subtotal = 16)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence				
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel		0 = 0	Yes =	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 11 )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes =	= 3
C. Biology (Subtotal = 11 )				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	<b>Q</b>	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75,	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other me	thods. See p. 35 of manua	l.		
Notes: Bull Run. Sandy substrate. Field Sheet	13-B-STR-01.			
	E			
Sketch:	1 State of the sta	^(		
pipeline ROW/access road	\	111		
Account the say of control page 1	Tayle - M.			
*	hillslope Ci	ılvert1		
ballast	illigiobe			
1 Traixs		1 /		

		Stre			ment lethodology f		) (For	m 1)		
			For use in	wadeable chan	nels classified a	s intermittent or			Impact/SAR	Impact
Project #	Р	Project Name	)	Locality	Class.	HUC	Date	SAR#	length	Factor
N/A	DC	2RVA - Area	04	VA	R4SB	02080106	2/1/2016			
Nam	e(s) of Evaluate	or(s)	Stream Nam	e and Informa	ation					
J. B	udnik, K. Astı	roth				04-S	ΓR-53			
I. Channel (	Condition: Asses	ss the cross-sec	tion of the stream							
	Optin	nal	Subo	ptimal c	onditional Categor	ginal	Po	or	Sev	ere
	The state of the s	WALKA .	1	>		less than Severe or stable than Severe	Overwiden Vertically/laterally		1	5
Channel Condition	Very little incision or 100% stable bank surface protection prominent (80-10 Stable point bars/b are present. Access floodplain or fully c bankfull benches. Mand transverse bar sediment deposition	ks. Vegetative or natural rock, 0%). AND/OR ankfull benches is to their original developed wide did-channel bars, is few. Transient covers less than	erosion or unproted of banks are si Vegetative protect prominent (60-Depositional feat stability. The bar channels are wellikely has access to or newly develope portions of the r	ew areas of active ted banks. Majority table (60-80%). iton or natural rock 80%) AND/OR ures contribute to kifull and low flow I defined. Stream o bankfull benches, d floodplains along each. Transient s 10-40% of the	or Poor due to lo Erosion may be pre both banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sec temporary/trans instability. Depositio stability, may be		widen further. Maj	ority of both banks crosion present on ks. Vegetative to 10-40% of fficient to prevent R 60-80% of the ad by sediment. orary/transient in outing to instability. ad channels have	Deeply incised vertical/lateral in- incision, flow con  banks. Streambe  rooting depth, m  vertical/underc  protection present or  banks, is not pre  Obvious bank slc  Erosion/raw ban  AND/OR Aggrading  than 80% of stream	stability. Severe tained within the ad below average hajority of banks ut. Vegetative on less than 20% of eventing erosion. bughing present. ks on 80-100%.
	10% of be	ollom.	stream	bottom.	banks and depositi	on on > 40% of the onal features which to stability.	40% of the bar sediment depos		deposition, contrib Multiple thread of subterran	uting to instability. channels and/or
Score	3		2	.4	2	2	1.	6	1	
NOTES>> Mar				F	ield Sheet	12-B-STR-(	)2.			
				ditional Cate					NOTES>>	
Riparian Buffers	Optin  Tree stratum (dbh > : with > 60% tree can non-maintained unde located within the	3 inches) present, nopy cover and a erstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area,	Low Poor: Impervious surfaces, mine	Pipeline co cuts across Stream run to pipeline yards befor to east into	s stream. is parallel for 50-75 re turning
			non-maintained understory.	vegetation).	canopy cover.	stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	recently seeded and stabilized, or other comparable condition.	lots, trails, or other comparable conditions.		
Condition	1.5	5	understory.  High	vegetation).	High	inches) present, with <30% tree canopy cover with maintained understory.	and stabilized, or other comparable condition.	other comparable conditions.		
Scores  1. Delineate rip descriptors. 2. Determine so pelow.	arian areas along exquare footage for ea	ach stream ban	High 1.2 k into Condition C	Low 1.1 ategories and Congth and width.	High 0.85 Indition Scores us	inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	and stabilized, or other comparable condition.  High  0.6	conditions.  Low 0.5  he sums iparian		
Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the %	arian areas along er quare footage for ea Riparian Area and S % Riparian Area> Score >	ach stream ban ach by measurin Score for each ri 20% 0.6	High 1.2 k into Condition C g or estimating le parian category in 80% 1.5	Low 1.1 ategories and Congth and width.	High 0.85 Indition Scores us	inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low 0.5 he sums iparian qual 100 100%	Cl= (Sum % RA * Si	,
Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the %	arian areas along er quare footage for ea Riparian Area and S % Riparian Area> Score >	ach stream ban ach by measurin Score for each ri 20% 0.6	High 1.2 k into Condition C g or estimating le parian category in 80% 1.5	Low 1.1 ategories and Congth and width.	High 0.85 Indition Scores us	inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low 0.5  he sums iparian qual 100	Rt Bank CI >	1.32
Scores  1. Delineate rip descriptors. 2. Determine st pelow. 3. Enter the % Right Bank  Left Bank  3. INSTREA	arian areas along er quare footage for ea Riparian Area and S % Riparian Area> Score >	ach stream ban ach by measurin Score for each ri 20% 0.6 80% 0.6 ried substrate si	High 1.2 k into Condition C g or estimating le parian category in 80% 1.5 20% 1.5 zes, water velocit	Low 1.1 ategories and Congth and width. (In the blocks below y and depths; wores.	High 0.85 Indition Scores us Calculators are prov.	inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the ovided for you	and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low 0.5  he sums iparian qual 100 100%	,	,
Scores  1. Delineate rip descriptors. 2. Determine st below. 3. Enter the %  Right Bank  Left Bank  3. INSTREAL undercut banks Instream	arian areas along exquare footage for ea  Riparian Area and S  % Riparian Area>  Score >  % Riparian Area>  Score >  M HABITAT: Var	ach stream ban ach by measurin 20% 0.6 80% 0.6 ried substrate sifte poole comple	High 1.2 k into Condition C g or estimating le parian category in 80% 1.5 20% 1.5 zes, water velocitexes, stable feature	Low 1.1  ategories and Congth and width. Con the blocks below	High 0.85 Indition Scores us Calculators are prov.  ody and leafy debut Category	inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the ovided for you	and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low 0.5 he sums iparian qual 100 100%	Rt Bank CI >	1.32
Scores  1. Delineate rip descriptors. 2. Determine st pelow. 3. Enter the % Right Bank  Left Bank  3. INSTREAL undercut banks	arian areas along equare footage for ea Riparian Area and S % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Var ; root mats; SAV; rift	ach stream ban ach by measurin 20% 0.6 80% 0.6 ried substrate si file poole comple	High 1.2 k into Condition C g or estimating le parian category in 80% 1.5  20% 1.5  zes, water velocit exes, stable featur Subor	Low 1.1  ategories and Congth and width. Congth	High  0.85 Indition Scores us Calculators are prov.  Ody and leafy debute the control of the con	inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substructions; stable substructions are typically ments are typically	and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en  ate; low embeded  Po  Habitat elements	conditions.  Low 0.5  he sums iparian qual 100 100%  100%  or listed above are	Rt Bank CI >	1.32
Scores  1. Delineate rip descriptors. 2. Determine su pelow. 3. Enter the % Right Bank  Left Bank  3. INSTREA undercut banks  Instream Habitat/	arian areas along equare footage for ea  Riparian Area and S  % Riparian Area>  Score >  % Riparian Area>  Score >  M HABITAT: Var ; root mats; SAV; riff	ach stream ban ach by measurin 20% 0.6 80% 0.6 ried substrate si file poole comple mal	High 1.2  k into Condition C g or estimating le parian category in 80% 1.5  20% 1.5  zes, water velocit exes, stable featur Stable habitat ele present in 30-50y are adequate fo	Low 1.1 sategories and Congth and width. Congth and width. Congth and depths; wores. Conditional	High  0.85  Indition Scores us Calculators are prov.  ody and leafy deball Category  Mary Stable habitater Stable present in 10-309	inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr  ginal ments are typically 6 of the reach and r maintenance of	and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	conditions.  Low 0.5  The sums iparian qual 100 100%  100%  Iness; shade;  Or listed above are stable. Habitat	Rt Bank CI >	1.32

	St	ream In	npact A	ssessm	ent For	rm Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX	VA	R4SB	02080106	2/1/2016	04-STR-53			
	L ALTERATION: Stream cross poil piles, constrictions, livestock	zation,	NOTES>>						
	Conditional Category  Negligible Minor Moderate Severe								
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	is disrupted by any of the channel	Greater than 8 disrupted by an alterations listed guidelines AND/0	30% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or nent.		
								3	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: View upstream toward Culvert 02 (15 inch brick and culvert) under railroad

Top Right: Typical view of stream

Bottom Left: Typical view of stream
Bottom Right: View of stream in gasline ROW

NC DWQ Stream Identification Form Version 4.11

04-STR-53

Date: 2/1/2016	Project/Site: DC2RVA - Area 04	Latitude: 37.862183
Evaluator: J. Budnik, K. Astroth	County: Hanover County	Longitude: -77.45839
Total Points: 20 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 7)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	1	2	3
3. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley		0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 6				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	( No	0 = 0	Yes	= 3
C. Biology (Subtotal = 7)				
18. Fibrous roots in streambed	3_	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	9	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	11	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method	ods. See p. 35 of manua	l.		
Notes: Field Sheet 13-B-STR-02.				
votes. Flora effect to B effect.				
Sketch:			C	culvert 2
			-	9
	_			111
				111

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
Drainat #		Project Name		wadeable chan	nels classified a Cowardin	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact	
Project #		•		•	Class.			SAR#	length	Factor	
N/A Nam	e(s) of Evalua	c2RVA - Area	Stream Nam	VA e and Informa	R2SB	02080106	2/2/2016				
	udnik, K. As	. ,				04-S	ΓR-54				
Channel C	Condition: Asse	ess the cross-sec	ction of the stream	and prevailing co	ondition (erosion,		-				
	Opti	imal	Subo	ptimal	onditional Catego	ry ginal	Po	or	Sev	ere	
	1	L WA	Slightly incised for	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally				
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse bar	on or natural rock, 100%). AND/OR /bankfull benches ass to their original y developed wide Mid-channel bars, ars few. Transient on covers less than	erosion or unproted of banks are sit Vegetative protect prominent (60-Depositional feat stability. The bar channels are wel likely has access to or newly develope portions of the right sediment cover	cted banks. Majority lable (60-80%). ioin or natural rock-80%) AND/OR ures contribute to kifull and low flow Il defined. Stream o bankfull benches, di floodplains along each. Transient s 10-40% of the bottom.	or Poor due to Ic Erosion may be pn both banks. Vegel 40-60% of banks. bevertical or unde 60% of strean sediment. See temporary/tran instability. Depositis stability, may be AND/OR V-shap	wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present. ed channels have on on > 40% of the	widen further. Maj are near vertical. 60-80% of bank protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape vegetative protectic 40% of the ban	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent 6 60-80% of the dby sediment. orary/transient in uting to instability, db channels have on is present on >	Deeply incised vertical/lateral in incision, flow cor banks. Streambe rooting depth, rr vertical/underc protection present to banks, is not pre Obvious bank sla Erosion/raw ban AND/OR Aggradin, than 80% of stream	stability. Severe tained within the di below average ajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%. g channel. Greater i bed is covered by	
			Sueam	bottom.	banks and depositi	ional features which to stability.	sediment depos		deposition, contrib Multiple thread of subterran	channels and/or	CI
Score	3	3	2	.4	;	2	1.	6	1		2.0
NOTES>>	N BUFFERS: A	Assess both bank	s's 100 foot riparia			13-B-STR-0		h may be accep	etable)		
	Onti	imal		ditional Cate		ainal		or	NOTES>>		
Riparian	Tree stratum (dbh: with > 60% tree ca	> 3 inches) present anopy cover and a	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3	Ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely	Low Poor: Impervious surfaces, mine spoil lands, denuded	Upper portion in pipeline and railroad ROW is disturbed.		
Buffers	located within th		containing both herbaceous and shrub layers or a non-maintained understory.	understory. Recent cutover (dense vegetation).	inches) present, with <30% tree canopy cover.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	surfaces, row crops, active feed lots, trails, or other comparable conditions.			
	located within th	e riparian areas.	herbaceous and shrub layers or a non-maintained understory.	understory. Recent cutover (dense vegetation).	with <30% tree canopy cover.	present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	maintained area, recently seeded and stabilized, or other comparable condition.	crops, active feed lots, trails, or other comparable conditions.			
Condition Scores  Delineate rip- escriptors. Determine sc	located within th	e riparian areas.  .5  each stream ban	herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C	understory. Recent cutover (dense vegetation).  Low 1.1	with <30% tree canopy cover.  High  0.85	present, tree stratum (dbh >3 inches) present, with +30% tree canopy cover with maintained understory.  Low  0.75	maintained area, recently seeded and stabilized, or other comparable condition.	crops, active feed lots, trails, or other comparable conditions.			
Condition Scores  Delineate rip: secriptors. Determine so	located within th	.5 each stream ban each by measurin Score for each r	herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition Cog or estimating leepartan category in	understory, Recent cutover (dense vegetation).  Low 1.1  attegories and Co	with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are presented to the canopy cover.	present, tree stratum (dbh >3 inches) present, with +30% tree canopy cover with maintained understory.  Low  0.75	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th	crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100			
Condition Scores  Delineate rip: secriptors. Determine so low. Enter the % I	1. arian areas along quare footage for e	.5 each stream ban	herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C	understory, Recent cutover (dense vegetation).  Low 1.1  attegories and Co	with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are presented to the canopy cover.	present, tree stratum (dbh >3 inches) present, with +30% tree canopy cover with maintained understory.  Low  0.75	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	crops, active feed lots, trails, and to the conditions.  Low  0.5			
Condition Scores  Delineate rip: secriptors. Determine so low. Enter the % I	1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	.5  each stream baneach by measurin Score for each r 50% 1.5	herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating legiparian category in 50%  0.6	understory, Recent cutover (dense vegetation).  Low 1.1  attegories and Co	with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are presented to the canopy cover.	present, tree stratum (dbh >3 inches) present, with +30% tree canopy cover with maintained understory.  Low  0.75	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	crops, active feed lots, rails, or other comparable conditions.  Low  0.5  De sums  iparian  qual 100  100%	CI≕ (Sum % RA * S		81
Condition Scores  Delineate rip: secriptors. Determine scolow. Enter the % I	1. arian areas along quare footage for e Riparian Area and % Riparian Area>	.5 each stream ban each by measurin Score for each r 50%	herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating legiparian category in 50%	understory, Recent cutover (dense vegetation).  Low 1.1  attegories and Co	with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are presented to the canopy cover.	present, tree stratum (dbh >3 inches) present, with +30% tree canopy cover with maintained understory.  Low  0.75	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100		cores*0.01)/2 1.05 0.90	CI 0.98
Condition Scores  Delineate rip: secriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAL	1. arian areas along quare footage for e Riparian Area and % Riparian Area> % Riparian Area>	.5 each stream ban each by measurin Score for each r 50% 1.5 50% 1.2 aried substrate s	herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category if 50% 0.6  50% 0.6  izes, water velocitizes, water velocitizes on structure in the	understory, Recent cutover (dense vegetation).  Low 1.1  ategories and Congth and width. Congth and width. Congth and depths; wores.	with <a href="https://doi.org/10.100/10.100/10.100/">doi.org/10.100/"&gt;doi.org/10.1000/"&gt;doi.org/10.1000/"&gt;doi.org/10.1000/"&gt;doi.org/10.1000/</a>	present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks ed	crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Les sums sparian 100  100%	CI= (Sum % RA * S Rt Bank CI >	1.05 0.90	
Condition Scores  Delineate rip: secriptors. Determine scolow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream	arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Va root mats; SAV; r	.5 each stream ban each by measurin Score for each r 50% 1.5 50% 1.2 aried substrate s	herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 50% 0.6  50% 0.6  izes, water velocitexes, stable feature.	understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Congth and width. Con the blocks below	with <a "="" 10.100="" distors="" doi.org="" href="https://doi.org/10.2007/10.2007/20.2007/&lt;/td&gt;&lt;td&gt;present, tree stratum (dbh &gt;3 inches) present, with &lt;30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you&lt;/td&gt;&lt;td&gt;maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks ed&lt;/td&gt;&lt;td&gt;crops, active feed lots, trails, active feed lots, trails, conditions.  Low 0.5  ne sums liparian loud 100%  100%&lt;/td&gt;&lt;td&gt;Cl= (Sum % RA * S&lt;br&gt;Rt Bank Cl &gt;&lt;br&gt;Lt Bank Cl &gt;&lt;br&gt;NOTES&gt;&gt;&lt;br&gt;Good grave&lt;br&gt;substrate,&lt;/td&gt;&lt;td&gt;1.05&lt;br&gt;0.90&lt;br&gt;el cobble&lt;br&gt;some&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;/tr&gt;&lt;tr&gt;&lt;td&gt;Condition Scores  Delineate riprescriptors. Determine scelow. Enter the % I Right Bank  Left Bank INSTREAI&lt;/td&gt;&lt;td&gt;arian areas along quare footage for e Riparian Area and % Riparian Area&gt; Score &gt;  M HABITAT: Va root mats; SAV; r&lt;/td&gt;&lt;td&gt;.5 each stream ban each by measurin Score for each r 50% 1.5  50% 1.2 aried substrate s iffle poole comple imal&lt;/td&gt;&lt;td&gt;herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category it 50% 0.6  50% 0.6  Zes, water velocit exes, stable features stable habitat ele present in 30-50 are adequate fo are non-maintained.&lt;/td&gt;&lt;td&gt;understory, Recent cutover (dense vegetation).  Low 1.1  ategories and Congth and width. (and the blocks below y and depths; wores. Conditional&lt;/td&gt;&lt;td&gt;with &lt;a href=" https:="" j.com="">dight <a href="https://distors/">https://distors/<a href="https://distors/">High</a></a></a>	present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ed  ate; low embeded	crops, active feed lots, rails, conter comparable conditions.  Low  0.5  Low  100%  100%  100%  Correspond to the conditions conditions conditions.	CI= (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>> Good grave substrate, riffle/pools	1.05 0.90 el cobble some	

	St	ream In	npact A	ssessm	ent For	m Page	e 2									
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor							
N/A	csx		VA	R2SB	02080106	2/2/2016	04-STR-54									
4. CHANNEL	L ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of ch	nannel, channeliz	ation,	NOTES>>								
embankments, s	poil piles, constrictions, livestock		Conditiona	I Category				Disturbed								
	Negligible	Mi	nor		erate	Sev	rere	and railroa	d ROWs.							
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.		Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or		Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or		Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or				CI
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			0.90						
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH									
NOTE: The CIs and R	RCI should be rounded to 2 decimal places. T	he CR should be roun	nded to a whole number	er.				CONDITION IN								
								I= (Sum of all C		0						
								I X LF X IF	∟iti (UN) >>	U						
INSERT PHO	TOS:						5110	/								
DESCRIBE F	PROPOSED IMPACT:															

NC DWQ Stream Identification Form Version 4.11

04-STR-54

Date: 2/2/2016	Project/Site: DC2RVA - Area 04	Latitude: 37.858529
Evaluator: J. Budnik, K. Astroth	County: Hanover County	Longitude: -77.457908
<b>Total Points:</b> $35.25$ Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 15)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 9.5			<b>.</b>	
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = <u>10.75</u> )	<u>.</u>			
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	8	1	(2)	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	(0.5)	11	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other methods	. See p. 35 of manua	ıl.		
Notes: Field Sheet 13-B-STR-03.				
		·		
culvert culvert	ow=>	and the second s	- With the dispussion of the second	

		Stre				Form for use in Virg	(For	m 1)			
					nels classified a	s intermittent or	perennial		Impact/SAR	Impact	
Project #	I	Project Name	•	Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R4SB3	02080106	2/2/2016				
	e(s) of Evalua udnik, K. As		Stream Nam	e and Informa	ation	04-S	TD 55				
	Condition: Asse		tion of the atroom	and provoiling o	andition (arasian		K-33				
Channel				C	onditional Catego	ry					
	Opti	imal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	~	AND SHAPE	Slightly incised, fu	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		Deeply incised	(or excavated)	
Channel Condition	Very little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.		Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Majo are near vertical. E 60-80% of banl protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib	rosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present obanks, is not pre Obvious bank sle Erosion/raw ban	stability. Severe tatained within the ad below average tajority of banks ut. Vegetative on less than 20% of eventing erosion. Doughing present. ks on 80-100%.			
			stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.  AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.			AND/OR Aggradin than 80% of strean deposition, contrib Multiple thread subterran	CI				
Score	3	3	2	.4		2	1.	6	1	l	2.0
NOTES>>	N BUFFERS: A	Assess both bank	d's 100 foot riparia			Sheet 13-l		h may be accep	otable)		
	1			ditional Cate					NOTES>>		
Riparian Buffers		> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present,	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area,	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	Left riparia access roa railroad.		
			herbaceous and shrub layers or a non-maintained understory.	Recent cutover (dense vegetation).	with <30% tree canopy cover.	stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	recently seeded and stabilized, or other comparable condition.	other comparable conditions.			
Condition		E	High	Low	High	Low	High	Low	-		
Delineate ripe escriptors. Determine so elow.	arian areas along quare footage for e	each stream ban each by measurin	g or estimating le	ngth and width. (	Calculators are pr		0.6  Ensure the of % R	iparian			
. Enter the % I	Riparian Area and % Riparian Area>	Score for each r	parian category in	the blocks below	v.		Blocks ed	qual 100 100%	-		
		0.75	0.5	1.2				2270			
Right Bank	Score >								Cl= (Sum % RA * S	cores*0.01)/2	
	1	15%	5%	80%				100%	Rt Bank CI >	1.06	CI
	% Riparian Area> Score >	15% 0.85	5% 0.75	80% 0.5				100%	Rt Bank Cl >	1.06 0.57	CI 0.81
Left Bank	% Riparian Area> Score > M HABITAT: Va	0.85 aried substrate si	0.75 zes, water velocit	0.5 y and depths; wo	ody and leafy del	oris; stable substr	ate; low embeded				
Left Bank INSTREAL	% Riparian Area>	0.85 aried substrate si	0.75 zes, water velocit	0.5 y and depths; wo		oris; stable substr	ate; low embeded		Lt Bank CI >		
Left Bank INSTREAI	% Riparian Area> Score > M HABITAT: Va	0.85  aried substrate si iffle poole comple	0.75  zes, water velocit exes, stable featur  Subo	0.5 y and depths; wo res. Conditionaptimal	I Category Mar	ginal	Po	ness; shade;	Lt Bank CI >		
Instream Habitat/ Available	% Riparian Area> Score >  M HABITAT: Va ; root mats; SAV; r  Opti  Habitat elements a	0.85  aried substrate si iffle poole comple imal  re typically present	0.75  zes, water velocitexes, stable feature  Subo  Stable habitat eler present in 30-509	o.5 y and depths; wo res. Conditiona ptimal ments are typically 6 of the reach and	I Category  Mar  Stable habitat ele present in 10-309	ginal ments are typically % of the reach and	Po Habitat elements lacking or are un	ness; shade;  Or  listed above are stable. Habitat	Lt Bank CI >		0.81
Left Bank INSTREAI ndercut banks; Instream Habitat/	% Riparian Area> Score > M HABITAT: Va ; root mats; SAV; r	0.85  aried substrate si iffle poole comple  imal  re typically present 0% of the reach.	0.75  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	y and depths; wo res.  Conditiona ptimal ments are typically	Stable habitat ele present in 10-30% are adequate fo popul	ginal ments are typically	Po Habitat elements	ness; shade;  Or  listed above are stable. Habitat ally present in less if the reach.	Lt Bank CI >		

	St	ream In	npact A	ssessm	ent Fo	rm Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB3	02080106	2/2/2016	04-STR-55		
	L ALTERATION: Stream cross poil piles, constrictions, livestock		Conditiona	I Category				NOTES>> Railroad tie	es in
	Negligible	Minor		Moderate 40 - 60% of reach 60 - 80% of reach		Severe		stream for vehicle/equ	uipment
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	is disrupted by any of the channel	Greater than 8 disrupted by an alterations listed guidelines AND/0	80% of reach is y of the channel in the parameter DR 80% of banks ibion, riprap, or	crossing.	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: Typical view of stream

Top Right: View of 4 foot brick Culvert 05 under railroad and gas ROW

Bottom Left: Typical view of stream

Bottom Right: View of stream along railroad with Culvert 05 and gas ROW

NC DWQ Stream Identification Form Version 4.11

04-STR-55

Date: 2/2/2016	Project/Site: DC2RVA - Area 04	Latitude: 37.854456
Evaluator: J. Budnik, K. Astroth	County: Hanover County	Longitude: -77.457614
<b>Total Points:</b> 30.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitter Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 15)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0		2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0		2	3
ripple-pool sequence	0	<u> </u>	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0		2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes	= 3
a artificial ditches are not rated; see discussions in manual	I.			
B. Hydrology (Subtotal = 7)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5		1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	
C. Biology (Subtotal = $8.5$				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)		(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	<del>                                     </del>	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed			OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method:	s. See p. 35 of manua			
Notes: Stream flows through pipeline ROW. Railro			tream for vehicle cr	ossing, Stream
likely flows to Stream 3. Field Sheet 13-B-S				<u> </u>
111111/				
Sketch:	171			
5 4 1 1 1/1	LOW			
Culvert 5	LOW			
ē This	railroad tie	s used for st	ream crossing	
3 1	- Tulli odd tie	J daca for at	realificiossilig	
5 H ! )	peline ROW	laccoss road		
pi pi	pelifie KOW,	access road	,	

-		Stre					(For	m 1)			
						or use in Virg					
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	04	VA	R2SB	02080106	2/1/2016				
	e(s) of Evaluat	or(s)	Stream Nam	e and Informa	ation	64.5-	ED 50				
	D. Mitchell						ΓR-56				
. Channel C	ondition: Asse			C	Conditional Catego	ry					
	Optio	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	rere	
	ondition  Surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than				Poor. Banks more	less than Severe or stable than Severe over bank slopes.	Overwiden Vertically/laterally widen further. Maj	unstable. Likely to	to Deeply incised (or excavated),		
Channel Condition			Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran instability. Depositi stability, may be	esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- in is covered by diment may be isient, contribute on that contribute to to forming/present.	are near vertical. É 60-80% of banl protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrit AND/OR V-shape	rosion present on ks. Vegetative int on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability, ad channels have	incision, flow cor banks. Streambi rooting depth, n vertical/underc protection present of banks, is not pre Obvious bank sli Erosion/raw bar AND/OR Aggradin	eut. Vegetative on less than 20% of eventing erosion. oughing present.			
	10% of bottom. sediment covers 10-40% of the stream bottom.		vegetative protecti banks and deposit	ion on > 40% of the ional features which to stability.			deposition, contrib Multiple thread subterrar	outing to instability. channels and/or	C		
Score	3 2.4		.4		2	1.	6	,	I	2.	
NOTES>>				F	ield Sheet 1	13-A-STRM	-4				
RIPARIAN	I BUFFERS: A	ssess hoth hank	c's 100 foot rinaria	an areas along the	e entire SAR (ro	udh measuremen	ts of length & widt	h may he accer	stable)		
. All Altirut	DOIT ENG. A	Document Dalle		ditional Cate		ag.i incasurenten	to or longer & wide	nay be accep	NOTES>>		
	Opti	mal	Subo	ptimal	Mar	ginal Low Marginal:	Po	or	Late succe	ssional	
Riparian Buffers	Optimal  Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and a non-maintained understory. Wetland: located within the riparian areas.		0% tree canopy cover and a to 60% tree canopy cover and a canopy cover and a maintained understory. Wetlands		High Marginal: Non-maintained, dense herbaceous vegetation, riparian areas vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  Non-maintained, dense herbaceous vegetation, riparian areas tree stratum, hay pen water. If present, tree canopy cover with 30% tree canopy cover with maintained.		s Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely egetated non-maintained area, recently seeded on other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		oth	
ı			High	Low	High	understory.	High	Low			
Condition	1.5	5	1.2	1.1	0.85	0.75	0.6	0.5	+		
escriptors. . Determine squ elow.	rian areas along e uare footage for ea	each stream ban	k into Condition C	Categories and Co	I ondition Scores us Calculators are pr	sing the	Ensure the of % R	ne sums iparian			
Right Bank	% Riparian Area>	100%						100%	]		
g Dalik	Score >	1.2							CI= (Sum % RA * S	cores*0,01\/2	
Loft Danis	% Riparian Area>	100%						100%	Rt Bank Cl >	1.20	С
Left Bank	Score >	1.2							Lt Bank CI >	1.20	1.2
		ried substrate si			ody and leafy deb	oris; stable substr	ate; low embeded	ness; shade;	NOTES>>		
		STREAM HABITAT: Varied substrate sizes, water velocity and depths; ut banks; root mats; SAV; riffle poole complexes, stable features.		res.							
ndercut banks; r	root mats; SAV; rif	ffle poole comple		Conditiona	l Category						
Instream Habitat/	root mats; SAV; rif	ffle poole comple	Subo Stable habitat ele	Conditiona ptimal ments are typically	Mar Stable habitat ele	ginal ments are typically	Po Habitat elements	listed above are			
Instream	root mats; SAV; rif	mal re typically present	Stable habitat ele present in 30-50% are adequate fo	Conditiona ptimal	Mar Stable habitat ele present in 10-30% are adequate fo			listed above are estable. Habitat ally present in less			С

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point Project # Date SAR length Impact Factor R2SB 02080106 2/1/2016 04-STR-56 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Stream has been channelixed in the Negligible Minor Severe past. 60 - 80% of reach 40 - 60% of reach is disrupted by any of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. is disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not cement. guidelines. guidelines. recovered. recovered. CI SCORE 1.5 1.3 1.1 0.9 0.7 0.5 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF

#### **INSERT PHOTOS:**



Top Left: Culvert 04 - 36 inch concrete

Top Right: View of stream

Bottom Right: 12 inch metal Culvert 05, drains to stream



NC DWQ Stream Identification Form Version 4.11

04-STR-56

Date: 2/1/2016	Project/Site: DC2RVA - Area 04	Latitude: 37.841545
Evaluator: D. Mitchell	County: Hanover County	Longitude: -77.457024
<b>Total Points:</b> 34.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitter Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*		Timucia i cicini	c.g. Quad Ivallic.	
A. Geomorphology (Subtotal = 16)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	$\odot$	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0		2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel  a artificial ditches are not rated; see discussions in manual	No	0 = 0	Yes	= 3
B. Hydrology (Subtotal = 12 )  12. Presence of Baseflow	0	1	2	(3)
	0	1	2	(3)
13. Iron oxidizing bacteria 14. Leaf litter	1.5	<u></u>		0
15. Sediment on plants or debris	0	0.5	0.5	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	-	0.5	Yes	
C. Biology (Subtotal = <u>6.5</u> )		<u> </u>	1.00	
18. Fibrous roots in streambed	3	2		0
19. Rooted upland plants in streambed	3	2	1	Ô
20. Macrobenthos (note diversity and abundance)	0	 1	(2)	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
			+	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

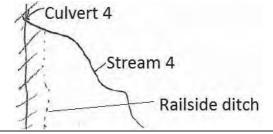
Notes: Field Sheet: 13-A-STRM-4.

26. Wetland plants in streambed

Sketch:

24. Amphibians

25. Algae



0

0

0.5

0.5

FACW = 0.75; OBL = 1.5 Other = 0

# Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

		For us	e in ephemeral s	treams				
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Area 04	VA	R6	02080106	2/1/2016			

Name(s) of Evaluator(s) Stream Name and Information

04-STR-57 D. Mitchell

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Cor	nditional Cate	gory				NOTES>>		
	Optimal	Subo	ptimal	Mar	ginal	Po	oor	Appears to	be a ditch	
Riparian Buffers	Tree stratum (dbh > 3 inches) pre with > 60% tree canopy cover an non-maintained understory. Wetl areas.	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recen cutover (dense vegetation).	> 3 inchae) procent	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	dug many to drain ar	ny years ago area. Field B-A STRM5.	
		High	Low	High	Low	High	Low			
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5			
Delineate ripa	rian areas along each stream b	ank into Condition Ca	tegories and Cond	lition Scores using	the descriptors.	Ensure t	the sums			
<ol><li>Determine squ below.</li></ol>	uare footage for each by measi	ring or estimating leng	gth and width. Ca	lculators are provi	ded for you	of % F	Riparian			
3. Enter the % R	iparian Area and Score for eac	h riparian category in t	he blocks below.			Blocks e	qual 100			
Right Bank	% Riparian Area> 100%						100%			
,	Score > 1.2									
								CI= (Sum % RA * S		
Left Bank	% Riparian Area> 100%						100%	Rt Bank CI >	1.20	
	Score > 1.2							Lt Bank CI >	1.20	L

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

THE REACH CONDITION INDEX (RCI) >>

0.60 RCI= (Riparian CI)/2

0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: View upstream, away from railroad tracks Top Right: View downstream, toward railroad tracks
Bottom Left: View of railroad ditch downstream (south) **Bottom Right: View upstream (north)** 

Project/Site: DC2RVA - Area 04

NC DWQ Stream Identification Form Version 4.11

Date: 2/1/2016

04-STR-57

Latitude: 37.831806

Evaluator: D. Mitchell	County: Hanov	er County	Longitude: -77.458021		
<b>Total Points:</b> 14 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determine	ination (circle one) ermittent Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal = 4)	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3	
2. Sinuosity of channel along thalweg	0	1	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	(1)	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	(0)	1	2	3	
7. Recent alluvial deposits	(0)	1	2	3	
8. Headcuts	0		2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	( No	0 = 0	Yes	= 3	
artificial ditches are not rated; see discussions in manua					
B. Hydrology (Subtotal = 3)					
12. Presence of Baseflow	0	(1)	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	( No	0 = 0	Yes	= 3	
C. Biology (Subtotal = 7					
18. Fibrous roots in streambed	3_	(2)	1	0	
19. Rooted upland plants in streambed	(3)	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	1	2	3	
21. Aquatic Mollusks	(0)	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1. Other = 0		
*perennial streams may also be identified using other me	ethods. See p. 35 of manua	al.			
Notes: Ditch appears to have been dug to dra	ain area to propagate	pine. Field Sheet: 1	3-A-STRM5.		
Sketch:					

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR Impact Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 04 02080106 2/1/2016 Stream Name and Information Name(s) of Evaluator(s) D. Mitchell 04-STR-58 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Field Sheet 13-A Low Marginal: Non-maintained, High Poor: Lawns, mowed STRM-2. ligh Suboptima High Marginal: Riparian areas ense herbaceou Riparian areas and maintained Low Poor: vegetation, riparian areas acking shrub and with tree stratur Non-maintained with tree stratum (dbh > 3 inches) areas, nurseries (dbh > 3 inches) present, with ense herhaceou no-till cropland vegetation with either a shrub Free stratum (dbh > 3 inches) preser spoil lands, resent, with 30% to 60% tree actively grazed Riparian 30% tree canon tree stratum, hav pasture, sparsely vegetated non-maintained area, with > 60% tree canopy cover and ar enuded surface cover and a maintained roduction, ponds open water. If laver or a tree canopy cover an containing both row crops, active eed lots, trails, or **Buffers** on-maintained understory. Wetland layer (dbh > 3 inches) present, understory present, tree herbaceous and recently seeded ther comparable Recent cutove with <30% tree stratum (dbh >3 shrub layers or a non-maintained and stabilized, o conditions. (dense vegetation). canopy cover. inches) present, with <30% tree understory canopy cover with maintained High High High Low Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% % Riparian Area> Right Bank 1.2

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

100%

1.2

% Riparian Area>

Score >

THE REACH CONDITION INDEX (RCI) >> 0.60 RCI= (Riparian CI)/2 0

Rt Bank CI >

Lt Bank CI >

CI= (Sum % RA \* Scores\*0.01)/2

1.20

1.20

CI

1.20

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

100%

### INSERT PHOTOS:

Left Bank



Project/Site: DC2RVA - Area 04

NC DWQ Stream Identification Form Version 4.11

Date: 2/1/2016

24. Amphibians

26. Wetland plants in streambed

25. Algae

04-STR-58

1.5

1.5

Latitude: 37.826092

Evaluator: D. Mitchell	County: Hanove	er County	Congitude: -77.460449  Other e.g. Quad Name:		
<b>Fotal Points:</b> 8.5 Stream is at least intermittent f ≥ 19 or perennial if ≥ 30*		nation (circle one) rmittent Perennial			
A. Geomorphology (Subtotal = 5)	Absent	Weak	Moderate	Strong	
a. Continuity of channel bed and bank	0		2	3	
2. Sinuosity of channel along thalweg	0	(1)	2	3	
B. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
I. Particle size of stream substrate	(0)	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	(0)	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
B. Headcuts	0	1)	2	3	
O. Grade control	0	0.5	1	1.5	
0. Natural valley	0	0.5	1	1.5	
Second or greater order channel	No	0 = 0	Yes :	= 3	
artificial ditches are not rated; see discussions in manual 3. Hydrology (Subtotal = $\frac{1.5}{1.5}$ )					
2. Presence of Baseflow	0	(1)	2	3	
3. Iron oxidizing bacteria	0	1	2	3	
4. Leaf litter	1.5	1	0.5	0	
5. Sediment on plants or debris	9	0.5	1	1.5	
6. Organic debris lines or piles	0	0.5	1	1.5	
7. Soil-based evidence of high water table?	No	= 0	Yes :	= 3	
C. Biology (Subtotal = 2)					
8. Fibrous roots in streambed	3	2	(1)	0	
9. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	<u>Q</u>	1	2	3	
21. Aquatic Mollusks		1	2	3	
22. Fish	@	0.5	1	1.5	
23. Crayfish	(0)	0.5	1	1.5	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream 3 flows to Little River. Field Sheet: 13-A-STRM-3.

Sketch:

Stream 3

0.5

0.5

FACW = 0.75; OBL = 1. Other = 0

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
Project #		Project Name		wadeable chan	nels classified a Cowardin	s intermittent or		SAR#	Impact/SAR	Impact	
•		•		Class.				SAR#	length		
N/A Name	e(s) of Evalua	2RVA - Area	Stream Nam	VA e and Informa	R2SB ation	02080106	2/1/2016				
1104111	D. Mitchell	(0)				STR-59	(Little Ri	ver)			
. Channel C	ondition: Asse	ss the cross-sec	ction of the stream	and prevailing c			(======================================	,			
	Opti	mal	Subo		Conditional Catego Mar	ry ginal	Po	or	Sev	ere	
	Channel Condition  Very little incision or active erosion; 80-100% stable banks. Vegetative erosion or unprotected banks. Majorit of banks are stable (60-80%). Vegetative protection or natural rock, prominent (80-100%). AND/OR, Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 19% of hothors.		Suboptimal			less than Severe or stable than Severe	Overwidened/incised.		5		
Channel Condition			or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strear sediment. Se temporary/tran instability. Depositi stability, may be	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present. ed channels have	widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in		banks, is not pre Obvious bank sle Erosion/raw ban AND/OR Aggradin	stability. Severe tained within the dd below average lajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%.			
	10% of bottom. sediment covers 10-40% of the stream bottom.		banks and deposit	ion on > 40% of the ional features which to stability.	e 40% of the banks and stable		than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.		CI		
Score	3 2.4			2	1.6		1		2.0		
NOTES>>				Fie	eld Sheet 1	3-A Stream	-02.				
2. RIPARIAN	N BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt	th may be accep	etable)		
	Opti	mal		ditional Cate	<del> </del>	ginal	Po	or	NOTES>>	forcet	
Riparian Buffers	Tree stratum (dbh : with > 60% tree ca	- 3 inches) present, inopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed jobs, active feed of other comparable conditions.	Beech Oak forest abuts both sides of channel.		
Condition			High	Low	High	Low	High	Low			
Condition Scores	1.	5	1.2	1.1	0.85	0.75	0.6	0.5			
descriptors. 2. Determine squelow.	arian areas along uare footage for e Riparian Area and	ach by measurin	g or estimating le	ngth and width. (	Calculators are pr	•	Ensure the of % R	iparian			
Right Bank	% Riparian Area>	100% 1.5						100%			
								4000/	CI= (Sum % RA * S	,	
Left Bank	% Riparian Area>	100% 1.5						100%	Rt Bank CI >	1.50 1.50	1.50
	/ HABITAT: Va	aried substrate si			ody and leafy del	oris; stable substr	ate; low embeded	lness; shade;	NOTES>>		
	root mats; SAV; r	me poole comple	exes, stable featu		l Category						
Instream Habitat/	Opti	mal		ptimal ments are typically		ginal ments are typically	Po Habitat elements		-		
Available Cover	Habitat elements a in greater than 5	re typically present 0% of the reach.	present in 30-50%	6 of the reach and r maintenance of	present in 10-309	% of the reach and ir maintenance of	lacking or are ur elements are typica	stable. Habitat			
	1.		popul	ations.	popul	ations.	than 10% of	f the reach.			CI 1.20
Score											

	St	ream In	npact A	ssessm	ent For	m Pag	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02080106	2/1/2016	04-STR-59		
	- ALTERATION: Stream cross poil piles, constrictions, livestock	sings, riprap, conc		concrete blocks,	straightening of ch	hannel, channeliz	zation,	NOTES>>	
	Negligible	Mi	nor	Mod	erate	Sev	/ere		
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	50% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or tent.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: View of Little River from CSX rail - view of CSX bridge
Top Right: View of CSX bridge over Little River
Bottom Left: View upstream from under CSX bridge
Bottom Right: View downstream

04-STR-59 Little River NC DWO Stream Identification Form Version 4.11 Project/Site: DC2RVA - Area 04 Date: 2/1/2016 Latitude: 37,825873 Evaluator: D. Mitchell County: Hanover County Longitude: -77.460521 Total Points: 49 Stream Determination (circle one) Other Stream is at least intermittent Ephemeral Intermitten Perennial e.g. Quad Name: if ≥ 19 or perennial if ≥ 30\* A. Geomorphology (Subtotal = 22**Absent** Weak Moderate Strong 1<sup>a.</sup> Continuity of channel bed and bank 0 3 2. Sinuosity of channel along thalweg 0 1 2 3 3. In-channel structure: ex. riffle-pool, step-pool, 0 2 3 1 ripple-pool sequence 2. 4. Particle size of stream substrate 0 3 1 5. Active/relict floodplain 0 3 1 6. Depositional bars or benches 0 1 3 7. Recent alluvial deposits 0 1 3 8. Headcuts 0 3 1 1.5 9. Grade control 0 0.5 10. Natural valley 0 1.5 0.5 11. Second or greater order channel No = 0Yes = 3artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 103 12. Presence of Baseflow 2 1 0 2 13. Iron oxidizing bacteria 1 3 14. Leaf litter 1.5 1 0.5 0 1 15. Sediment on plants or debris 0.5 16. Organic debris lines or piles 1.5 0.5 1 17. Soil-based evidence of high water table? No = 0Yes = 3C. Biology (Subtotal = 17 18. Fibrous roots in streambed 3 2 19. Rooted upland plants in streambed 2 0 1 20. Macrobenthos (note diversity and abundance) 2 3 1 21. Aquatic Mollusks 0 1 2 3 22. Fish 0 0.5 1 23. Crayfish 0 0.5 1 24. Amphibians 0.5 0 1 1.5 25. Algae 0 0.5 1.5 FACW = 0.75; OBL = 1. Other = 0 26. Wetland plants in streambed \*perennial streams may also be identified using other methods. See p. 35 of manual. Notes: Field Sheet: 13-A-STR-2. Sketch: Little River

		Stre					(For	m 1)			
						or use in Virg					
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	04	VA	R2SB	02080106	2/1/2016				
Name	e(s) of Evaluat	or(s)	Stream Nam	e and Informa			_				
	D. Mitchell						<b>0</b> (Bull R	un)			
. Channel C	ondition: Asse	ss the cross-sec	tion of the stream		ondition (erosion, conditional Catego						
	Optimal		Suboptimal		Marginal		Poor		Sev	rere	
	Very little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient endinent developed the control of t		Slightly incised, few areas of active		rity or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute instability. Deposition that contribute to stability, may be forming/present.		Vertically/laterally unstable. Likely to widen further. Majority of both banks fare near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in onature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable		Leeply included to exchange of the control of the c		
Channel Condition			table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along								
			sediment covers 10-40% of the								С
Score	3		2	4		2	1.	6	,	I	2.
NOTES>>	N BUFFERS: A	ssass both bank	rla 100 faat rinaris			3-A Stream		th may be accom	stable)		
. KIFAKIAI	V BUFFERS. A	ssess bott battr		ditional Cate		ugri measuremen	is or length & wid	in may be accep	NOTES>>		
	Opti	mal		Suboptimal Marginal			Poor		Beech Oak forest		
Riparian Buffers	with > 00 % tree carriopy cover and a		> 60% tree canopy cover and a naintained understory. Wetlands canopy cover and canopy cover and		High Marginal: Non-maintained, dense herbaceous vegetation with dense herbaceous vegetation with		Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, recently seeded and stabilized, or other comparable condition.				
			High	Low	High	Low	High	Low			
Condition Scores	1.	5	1.2	1.1	0.85	0.75	0.6	0.5	]		
. Delineate ripa lescriptors. . Determine squelow.	uare footage for e	ach by measurin Score for each ri	g or estimating le	ngth and width. (	ndition Scores using the calculators are provided for you		Ensure the sums of % Riparian Blocks equal 100				
Right Bank	% Riparian Area>	100% 1.5						100%			
									CI= (Sum % RA * S	cores*0.01)/2	
Left Bank	% Riparian Area>	100% 1.5						100%	Rt Bank CI >	1.50 1.50	1.5
B. INSTREAM	M HABITAT: Va		zes, water velocit	ty and depths; wo	ody and leafy del	oris; stable substr	ate; low embeded	lness; shade;	NOTES>>	1.00	1.3
	root mats; SAV; ri			res.	al Category						
Instream	Opti	Optimal Suboptimal				ginal	Poor		-		
Habitat/ Available Cover	Habitat elements ar		present in 30-509	ments are typically % of the reach and r maintenance of	present in 10-309	ments are typically % of the reach and or maintenance of	Habitat elements lacking or are ur elements are typic	stable. Habitat			
C0461	3. 2.2.0			ations.		lations.	than 10% or				С
Score	1.	F		.2		.9	0.			ŀ	1.2

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02080106	2/1/2016	04-STR-60		
	ALTERATION: Stream cross poil piles, constrictions, livestock		Conditiona	I Category				NOTES>>	
	Negligible	Mi	nor	Mod	erate	Sev	ere		
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidellines AND/C shored with ga cem	y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: View upstream (south)
Top Right: View downstream (north)

Bottom Left: View north from the Henry Street culvert
Bottom Right: Washout of stream into WTL-02 at burried culverts

**NC DWQ Stream Identification Form Version 4.11** 

04-STR-60

Date: 2/1/2016	Project/Site: DC2RVA - Area 04	Latitude: 37.82	22810		
Evaluator: D. Mitchell	County: Hanover County Longitude: -77.46				
<b>Total Points:</b> 39.5 Stream is at least intermittent if ≥ 19 or perennial if ≥ $30^*$	Stream Determination (circle one) Ot				
A. Geomorphology (Subtotal = 21)	Absent Weak	Moderate	Strong		

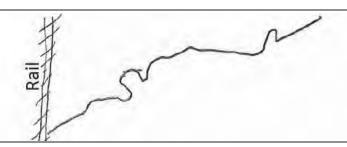
if ≥ 19 or perennial if ≥ 30*	Ephemeral Intel	rmitten Perenn	e.g. Quad Name:	i	
A. Geomorphology (Subtotal = 21)	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)	
Sinuosity of channel along thalweg	0	1	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
Particle size of stream substrate	0	_1_	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	(1)	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	No	= 0	Yes = 3		
<sup>a</sup> artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = $10.5$ )					
12. Presence of Baseflow	0	1	2	(3)	
13. Iron oxidizing bacteria	0	(1)	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	No	= 0	Yes	= 3	
C. Biology (Subtotal = 8	·				
18. Fibrous roots in streambed	3	(2)	1	0	
19. Rooted upland plants in streambed	3	(2)	1	0	
20. Macrobenthos (note diversity and abundance)	0	1	2	3	
				_	

· ·							
C. Biology (Subtotal = $8$ )							
18. Fibrous roots in streambed	3	(2)	1	0			
19. Rooted upland plants in streambed	3	(2)	1	0			
20. Macrobenthos (note diversity and abundance)	0	1	2	3			
21. Aquatic Mollusks	0	1	2	3			
22. Fish		0.5	1	1.5			
23. Crayfish	0	0.5		1.5			
24. Amphibians	0	0.5	(1)	1.5			
25. Algae	0	0.5	1	1.5			
26. Wetland plants in streambed	FACW = 0.75; OBL = 1. Other = 0						

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet: 13-A-Strm 01.

Sketch:



#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Impact Cowardin Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 05 02080106 2/2/2016 Stream Name and Information Name(s) of Evaluator(s) D. Mitchell 05-STR-01 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** Optimal Suboptimal Marginal Mature forest on Low Marginal: Non-maintained, High Poor: Lawns, mowed both banks. Field ligh Suboptima High Marginal: Riparian areas ense herbaceou Sheet 13-A STM-07. and maintained Riparian areas Low Poor: with tree stratum (dbh > 3 inches) present, with vegetation, riparian areas acking shrub and Non-maintained with tree stratum (dbh > 3 inches) reas, nurseries ense herhaceou no-till cropland vegetation with either a shrub Free stratum (dbh > 3 inches) preser spoil lands, resent, with 30% to 60% tree actively grazed Riparian 30% tree canon tree stratum, hav pasture, sparsely vegetated non-maintained area, with > 60% tree canopy cover and ar enuded surface cover and a maintained roduction, ponds open water. If laver or a tree canopy cover an containing both row crops, active eed lots, trails, or **Buffers** on-maintained understory. Wetland layer (dbh > 3 inches) present, understory present, tree herbaceous and recently seeded ther comparable Recent cutove with <30% tree stratum (dbh >3 shrub layers or a non-maintained and stabilized, o conditions. (dense vegetation). canopy cover. inches) present with <30% tree understory canopy cover with maintained High High High Low Low Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank 1.5 Score > CI= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > 1.50 CI Left Bank 1.50 Lt Bank CI > 1.50 Score > 1.5 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number THE REACH CONDITION INDEX (RCI) >> 0.75 RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF

INSERT PHOTOS:



Project/Site: DC2RVA - Area 05

NC DWQ Stream Identification Form Version 4.11

Date: 2/2/2016

05-STR-01

Latitude: 37.815633

Evaluator: D. Mitchell	County: Hanov	er County	Longitude: -77.464013		
<b>Total Points:</b> 14 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name	:	
A. Geomorphology (Subtotal = 9)	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0		2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	1	(2)	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	(0)	1	2	3	
7. Recent alluvial deposits		1	2	3	
8. Headcuts	0	1	(2)	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	(N	0 = 0	Yes	= 3	
<sup>a</sup> artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = $1.5$					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria		1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	N	0 = 0	Yes	l .	
C. Biology (Subtotal = 3.5					
18. Fibrous roots in streambed	3	2	<u>(1)</u>	0	
19. Rooted upland plants in streambed	3	2		0	
20. Macrobenthos (note diversity and abundance)	Q	1)	2	3	
21. Aquatic Mollusks	(0)	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OB			
*perennial streams may also be identified using other meth	nods. See p. 35 of manua				
Notes: Field Sheet: 13-A-STM-7.	·				
Sketch:	11/1		N		
Stream 6	1+	Little Anna	River		

		Stre		SSESS			(For	m 1)			
D		Dva is at Name		wadeable chan	nels classified a			CAD#	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A Nam		2RVA - Area		VA e and Informa	R2SB	02080106	2/2/2016				
INdill	e(s) of Evaluat  D. Mitchell	.01(5)	Stream Nam	e and inform		R-02 (S	outh Anna	Piver)			
I. Channel C	Condition: Asset	ss the cross-sec	tion of the stream	and prevailing c			outii Aiiii	a ikivei)			
	Optio				Conditional Catego		Po	or	Sev	vere.	
	-	AND AND AND AND AND AND AND AND AND AND	1		Often incised, but	less than Severe or stable than Severe	Overwiden	ed/incised.	1	5	
Channel Condition	Very little incision or 100% stable ban surface protection prominent (80-ft. Stable point bars/t are present. Acces floodplain or fully bankfull benches. I and transverse bas sediment deposition 10% of t	nks. Vegetative n or natural rock, 00%). AND/OR pankfull benches as to their original developed wide Mid-channel bars, rs few. Transient n covers less than	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wellikely has access to or newly develope portions of the r	ew areas of active cted banks, Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, d floodplains along each. Transient is 10-40% of the	or Poor due to Ic Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se- temporary/tran instability. Depositi stability, may be AND/OR V-shap	wer bank slopes, esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute forming/present. ed channels have	widen further. Maji are near vertical. E 60-80% of bani protection presei banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrii AND/OR V-shape vegetative protecti	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent 6 60-80% of the dby sediment. orary/transient in uting to instability, db channels have on is present on >	incision, flow con banks. Streambe rooting depth, rr vertical/underc protection present c banks, is not pre Obvious bank sla Erosion/raw ban AND/OR Aggradin,	stability. Severe tained within the ad below average apority of banks ut. Vegetative on less than 20% of eventing erosion. Sughing present. ks on 80-100%.  g channel. Greater	
	1070 01 2	outom.	stream	bottom.	banks and deposit	on on > 40% of the ional features which to stability.	vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.		deposition, contributing to instability.		CI
Score	3		2	.4		2	1.	6	1		2.0
NOTES>>				F	ield Sheet	13-A-STM-(	06.				
2. RIPARIAI	N BUFFERS: A	ssess both bank		an areas along the		ugh measuremen	ts of length & widt	h may be accep	otable)		
	Optii	Optimal Suboptimal		Marginal							
			Subo	ptimal	Mar	T	Po	or	Mature for	est on	
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca non-mainlaned und located within the	3 inches) present, nopy cover and a lerstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.	Mature fore both banks		
Buffers	with > 60% tree car non-maintained und located within the	3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with ~30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	Mature fore both banks		
Condition Scores  1. Delineate ripiescriptors. 2. Determine scoelow.	with > 60% tree can non-maintained und located within the  1.4  arian areas along e quare footage for ea	3 inches) present, nopy cover and a leastory. Wetlands riparian areas.  5 each stream ban ach by measurin Score for each riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. (	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Indition Scores us Calculators are present the condition of	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	Mature fore both banks		
Condition Scores  Delineate ripiescriptors. Delevermine scorelow.	with > 60% tree can non-maintained and located within the	3 inches) present, nopy cover and a lerstory. Weltands e riparian areas.  5  seach stream ban arch by measurin Score for each ri	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. (	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Indition Scores us Calculators are present the condition of	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure te of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	Mature fore both banks		
Condition Scores  1. Delineate ripidescriptors. 2. Determine schelow. 3. Enter the % I	with > 60% tree ca non-maintained und located within the	3 inches) present, nopy cover and a lerstory. Wetlands in partial areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. (	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Indition Scores us Calculators are present the condition of	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure te of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  The sums iparian qual 100 100%	Mature fore both banks	cores*0.01)/2	
Condition Scores  1. Delineate ripidescriptors. 2. Determine schelow. 3. Enter the % I	with > 60% tree ca non-maintained und located within the 1.4 arian areas along e quare footage for ea Riparian Area and S % Riparian Area>	3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.  5  each stream ban ach by measurin 100% 1.5	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. (	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Indition Scores us Calculators are present the condition of	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure te of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	Mature fore both banks CI= (Sum % RA * S Rt Bank CI >	cores*0.01)/2	CI 1.50
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAL	with > 60% tree ca non-maintained und located within the	3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.  5 each stream ban ach by measurin 100% 1.5 100% 1.5	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low 1.1  Categories and Co ngth and width. (	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High  0.85  Calculators are pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present tree stratum (dbh > 3 inch	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	Mature fore both banks	cores*0.01)/2	CI 1.50
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I	with > 60% tree can non-maintained und located within the  1  arian areas along e quare footage for ex Riparian Area and s % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Va root mats; SAV; rife	3 inches) present, nopy cover and a erestory. Wetlands riparian areas.  5  5  5  6  6  6  7  8  8  8  8  8  8  8  8  8  8  8  8	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable feature	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (In the blocks below ty and depths; wores. Conditiona	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are productions of the condition of the condit	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, twee stratum (dbh > 3 inches) present. The stratum (dbh > 3 inches)	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	Mature fore both banks Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2	
Condition Scores  1. Delineate ripi descriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	arian areas along e quare footage for ea Riparian Area and S % Riparian Area> Score >  M HABITAT: Va root mats; SAV; rif	3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.  5  beach stream ban arch by measurin 100% 1.5  100% 1.5  ried substrate si ffle poole comple	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo Stable habitat elei	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. (and the blocks below ty and depths; wo res. Conditiona ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  W.  In Category  Mar  Stable habitat ele	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks end Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%  100%  or iness; shade;	Mature fore both banks Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2	
Condition Scores  Delineate ripidescriptors. Ender the % I Right Bank  Left Bank  Left Bank  Instream	with > 60% tree can non-maintained und located within the  1  arian areas along e quare footage for ex Riparian Area and s % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Va root mats; SAV; rife	3 inches) present, nopy cover and a erestory. Wetlands riparian areas.  5  5  each stream ban ach by measurin 100% 1.5  100% 1.5  ried substrate si ffle poole comple mal	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo Stable habitat ele present in 30-50% are adequate fo	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. ( In the blocks below  ty and depths; wo res.  Conditiona ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrud layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High 0.85  Indicate the canopy cover with the canopy cover.  All Category Mar Stable habitat ele present in 10-30 are adequate for are dense to the canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you  pris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%  100%  Interest shade;  or listed above are stable. Habitat	Mature fore both banks  CI= (Sum % RA*S Rt Bank CI > Lt Bank CI > NOTES>>	cores*0.01)/2	

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX VA			R2SB	02080106	2/2/2016	05-STR-02		
	ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, conc	crete, gabions, or		straightening of ch	nannel, channeliz	cation,	NOTES>> Areas have	e likely
	Negligible	Minor		Moderate		Severe		been chan	nelized.
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	DEVCH C	ONDITION II	NDEV and 9	TDEAM CON	IDITION UN	ITS EAD TH	IS DEACH		

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View upstream
Top Right: View of railroad bridge

Bottom Left: View of bridge over South Anna River Bottom Right: View of the South Anna floodplain

NC DWQ Stream Identification Form Version 4.11 South Anna River 05-STR-02

THE DAY Q Stream ruentmention Form Action 4.11								
Date: 2/1/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.815769						
Evaluator: D. Mitchell	County: Hanover County	Longitude: -77.463951						
<b>Total Points:</b> 41.06 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:						

0			
U	1	2	(3)
0	$\bigcirc$	2	3
0	1	2	3
0	1	(2)	3
0	1	2	3
0	1	2	(3)
0	1	2	(3)
0	1	2	3
0	0.5	1	1.5
0	0.5	1	1.5
No	O = 0	Yes:	= 3
0	1	2	(3)
0	1	2	3
1.5	1	0.5	0
0	0.5	1	1.5
0	0.5	1	1.5
No	0 = 0	Yes:	= 3
3	2	1	(0)
3	2	1	(0)
0	1	2	3
0	1	2	(3)
0	0.5	1	1.5
0	0.5	1	1.5
0	0.5	1	1.5
0	0.5	1	1.5
	FACW = 0.75;	OBL = 1.5 Other = 0	
. See p. 35 of manua	al.		
STRM-6 = South	Anna River.		
	/		
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 0.5 0 0.5 No = 0   0 1 1.5 1 0 0.5 0 0.5 No = 0  3 2 3 2 0 1 0 1 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5	0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 0 1 2 0 0 0.5 1 0 0.5 1 No = 0 Yes:    0 0 1 2   0 0.5 1   0 0.5 1   0 0.5 1   0 0.5 1   0 0.5 1   0 0.5 1   0 0.5 1   0 0.5 1   0 0.5 1   0 0.5 1   0 0 0.5 1

		Stre		fied Stream M	lethodology f	for use in Virg	ginia	III I <i>)</i>			
Project #		Project Name		Locality	nels classified a Cowardin Class.	HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	05	VA	R4SB	02080106	2/2/2016		length	1 dotoi	
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
	D. Mitchell					05-S	ΓR-03				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal c	onditional Catego Mar	ginal	Po	or	Sev	ere	
	Very little incision or active erosion; 80- 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient to		13		Often incised, but I	less than Severe or	Overwiden	ed/incised.	1	5	
Channel Condition			erosion or unproted of banks are stogetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to revelope the protection of the	tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow Il defined. Stream o bankfull benches, d floodplains along	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositiv stability, may be	stable than Severe ower bank slopes: resent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sisient, contribute on that contribute to torming/present.	Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable		Deeply incised vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/lunderc protection present c banks, is not pre Obvious bank sl. Erosion/raw ban AND/OR Aquaradin	stability. Severe tained within the dd below average hajority of banks ut. Vegetative on less than 20% of venting erosion. Doughing present. ks on 80-100%.	
	10% of	on covers less than bottom.	portions of the reach. Transient sediment covers 10-40% of the stream bottom.		vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.					С
Score	3	3	2	.4	:	2	1.	6	1		2.4
2. RIPARIAI	N BUFFERS:	Assess both bank	's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	on. Field Si	table)		
2. RIPARIAI		Assess both bank	Con	an areas along the ditional Cate ptimal	gory	ugh measuremen	Po	or	NOTES>> Left bank h	nas 40%	
2. RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con	ditional Cate	gory	Ginal  Low Marginal:  Non-maintained, dense herbaceous vegetation,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	or	NOTES>>	nas 40% 6 slope to	
Riparian Buffers	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ir iparian areas lacking shrub and tree stratum, hor production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or	NOTES>> Left bank h woods 20%	nas 40% 6 slope to	
Riparian	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Left bank h woods 20%	nas 40% 6 slope to	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree cr non-maintained un located within th  1. arian areas along quare footage for e	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100	NOTES>> Left bank h woods 20%	nas 40% 6 slope to	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so	Tree stratum (dbh: with > 60% tree cr non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row curops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Left bank h woods 20% 40% ballas	nas 40% % slope to t.	
Riparian Buffers  Condition Scores  Delineate rip descriptors. Delineate rip descriptors. Enter the %	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each ri  100%  1.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel olts, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100  100%	NOTES>> Left bank h woods 20% 40% ballas	nas 40% 6 slope to t.	C
Riparian Buffers  Condition Scores  Delineate rip descriptors. Delineate rip descriptors. Enter the %	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100	NOTES>> Left bank h woods 20% 40% ballas	nas 40% % slope to t.	CI 1.2
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 100% 1.5  40% 1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  20% 0.85  zes, water velocii	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious grades, mine spoil lands, denuded surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Left bank h woods 20% 40% ballas  Cl= (Sum % RA * S Rt Bank CI >	nas 40% 6 slope to t.	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % Right Bank  Left Bank  Jundercut banks,	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5  each stream ban each by measurin 100% 1.5  40% 1.2  aried substrate si iffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  20% 0.85  zes, water velocit exes, stable featu	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the rovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%	NOTES>> Left bank I woods 20% 40% ballas  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	nas 40% 6 slope to t.	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 100% 1.5  40% 1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  20% 0.85  zes, water velocit exes, stable featu	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. ( In the blocks below  40% 0.6  by and depths; wo res.  Conditiona ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicate the control of the cont	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, injarian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the covided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100 100%  100%	NOTES>> Left bank I woods 20% 40% ballas  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	nas 40% 6 slope to t.	
Condition Scores  Delineate rip descriptors. Left Bank  Left Bank  Left Bank  INSTREAl undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree co. non-maintained un located within th located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  M Riparian Area> Score >  M HABITAT: Vi. root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 100% 1.5  40% 1.2  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  20% 0.85  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the rovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks end blocks en	Low Poor: Impervious surfaces, mine spail lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Left bank I woods 20% 40% ballas  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	nas 40% 6 slope to t.	1.2
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi; root mats; SAV; r  Opti Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 100% 1.5  40% 1.2  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in  20% 0.85  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below  1.4  40% 0.6  by and depths; wo res.  Conditiona ptimal ments are typically % of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the rovided for you  bris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en  Attention of the comparable condition of the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trains conditions.  Low 0.5  Low 0.5  he sums iparian qual 100  100%  100%  Iness; shade;	NOTES>> Left bank I woods 20% 40% ballas  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	nas 40% 6 slope to t.	

	St	ream In	npact A	ssessm	ent For	m Pag	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB	02080106	2/2/2016	05-STR-03		
	_ ALTERATION: Stream cross poil piles, constrictions, livestock	sings, riprap, conc	rete, gabions, or		straightening of ch	hannel, channeliz	cation,	NOTES>>	
	Negligible	Mir	nor		erate	Sev	rere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	in the parameter OR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5	1	

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

#### INSERT PHOTOS:



Top Left: View of stream as it exits WTL-04 Top Right: Typical view of stream Bottom Left: Typical view of stream Bottom Right: Typical view of stream

Project/Site: DC2RVA - Area 05

NC DWQ Stream Identification Form Version 4.11

Date: 2/2/2016

05-STR-03

Latitude: 37.807544

Evaluator: D. Mitchell	County: Hanove	er County	Longitude: -77.466674		
<b>Total Points:</b> 22.75  Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle one) rmitten Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal = 8)	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	1	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	(1)	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	(0)	1	2	3	
7. Recent alluvial deposits		1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5		1.5	
11. Second or greater order channel  a artificial ditches are not rated; see discussions in manual	No	0 = 0	Yes =	= 3	
B. Hydrology (Subtotal = 8.5)			_		
12. Presence of Baseflow	0	1	(2)	3	
13. Iron oxidizing bacteria	0	1)	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5		1.5	
16. Organic debris lines or piles	0	0.5		1.5	
17. Soil-based evidence of high water table?	No	0 = 0	Yes =	= 3	
C. Biology (Subtotal = 6.25					
18. Fibrous roots in streambed	3	(2)	1	0	
19. Rooted upland plants in streambed	3	2	(1)	0	
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3	
21. Aquatic Mollusks	(0)	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5		1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = $0.75$ ; OB	L = 1.5 Other = 0	1	
*perennial streams may also be identified using other method	ds. See p. 35 of manua	l.			

# Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

	For use in ephemeral streams											
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor				
N/A	DC2RVA - Area 05	VA	R6	02080106	2/2/2016							

Name(s) of Evaluator(s) Stream Name and Information

05-STR-04 D. Mitchell

RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Cor	ditional Cate	gory				NOTES>>		
	Optimal	Subo	ptimal	Mar	ginal	Po	oor	Field Shee	t 13-A	
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	Riparian areas with tree stratum (db. 7 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	3 inches) present, with >30% tree canopy cover and a	vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ponds, open water.	nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	STRM-9.		
		High	Low	High	Low	High	Low			
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5			
Delineate ripa	rian areas along each stream bank	into Condition Cat	egories and Cond	ition Scores using	the descriptors.	Ensure	the sums			
<ol><li>Determine squ below.</li></ol>	uare footage for each by measuring	or estimating leng	th and width. Cal	culators are provid	ded for you	of % F	Riparian			
3. Enter the % R	tiparian Area and Score for each rip	arian category in t	he blocks below.			Blocks 6	equal 100			
Right Bank	% Riparian Area> 100%						100%			
Mynt Bank	Score > 1.2									
								CI= (Sum % RA * S	cores*0.01)/2	
Left Bank	% Riparian Area> 100%						100%	Rt Bank CI >	1.20	
Leit Balik	Score > 1.2							Lt Bank CI >	1.20	1

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

THE REACH CONDITION INDEX (RCI) >>

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

0.60

CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: Typical view of stream

Top Right: View of spring that feeds the spring

Bottom Left: View of Culvert 10 **Bottom Right: View of Culvert 09** 

NC DWQ Stream Identification Form Version 4.11

05-STR-04

Date: 2/2/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.802168
Evaluator: D. Mitchell	County: Hanover County	Longitude: -77.468550
Total Points: 14 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = $\frac{7.5}{}$ )	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	$\bigcirc$	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	1_	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	(N	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual			•	
B. Hydrology (Subtotal = $2.5$				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes	
C. Biology (Subtotal = 4)			1	
18. Fibrous roots in streambed	3	2		0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other metho	ds. See p. 35 of manua			
Notes: Culverts 9 & 10. Small channel currently h	nas low flow due to	snow. Further de	ownstream the stre	eam goes unde
ground. Field Sheet: 13-A-STRM-9.	1 de	Culvert 9		
g.comar.com content of the content o	1			
Sketch:	- 11		17	
	1 9		N	
		1	14	
	Kalliroad			
	11	1		
	11011	\\Stream	am 9	
	Culvert 10	)	_	
E V	1 10	old rail		_

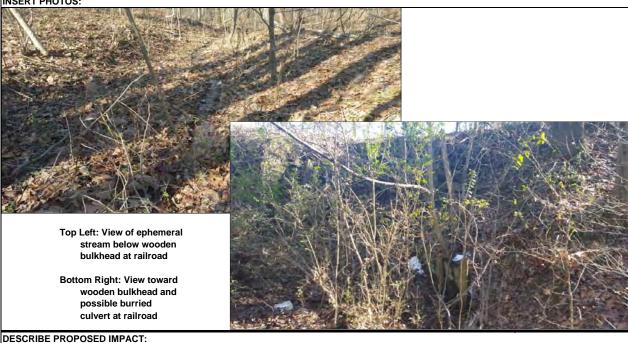
#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Impact Cowardin Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 05 02080106 2/2/2016 Stream Name and Information Name(s) of Evaluator(s) D. Mitchell 05-STR-05 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** Optimal Suboptimal Marginal Field Sheet 13-A Low Marginal: Non-maintained, High Poor: Lawns, mowed STRM-10. ligh Suboptima High Marginal: Riparian areas ense herbaceou Riparian areas and maintained Low Poor: vegetation, riparian areas with tree stratum Non-maintained with tree stratum (dbh > 3 inches) areas, nurseries (dbh > 3 inches) present, with ense herhaceou no-till cropland acking shrub and Free stratum (dbh > 3 inches) presen spoil lands, resent, with 30% to 60% tree actively grazed Riparian either a shrub 30% tree canon tree stratum, hav pasture, sparsely vegetated non-maintained area, with > 60% tree canopy cover and ar enuded surface cover and a maintained roduction, ponds open water. If laver or a tree canopy cover an containing both row crops, active eed lots, trails, or **Buffers** on-maintained understory. Wetland layer (dbh > 3 inches) present, understory present, tree herbaceous and recently seeded ther comparable Recent cutove with <30% tree stratum (dbh >3 shrub layers or a non-maintained and stabilized, o conditions. (dense vegetation). canopy cover. inches) present, with <30% tree her comparable condition. understory canopy cover with maintained High High High Low Low Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 100% Right Bank 1.5 CI= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > 1.50 CI Left Bank 1.50 Lt Bank CI > Score > 1.5 1.50 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number THE REACH CONDITION INDEX (RCI) >> 0.75 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

INSERT PHOTOS:



Project/Site: DC2RVA - Area 05

NC DWQ Stream Identification Form Version 4.11

Date: 2/2/2016

Sketch:

Railroad

05-STR-05

Latitude: 37.800284

Evaluator: D. Mitchell	County: Hanove	r County	Longitude: -77	'.4689426
<b>Total Points:</b> 12 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) mittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 6)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	$\bigcirc$	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits		1_	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	( No	= 0	Yes :	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = $2.5$ )				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes :	= 3
C. Biology (Subtotal = 3.5	_			
18. Fibrous roots in streambed	3	2	( <u>1</u> )	0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish		0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	
*perennial streams may also be identified using other meth	nods. See p. 35 of manual			
Notes: Small stream forming from seep next to	rail bed. Field Sheet:	13-A-STRM-10.		

Stream 10

logging road

# Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

			For us	e in ephemeral s	treams				
Project #	Project Name	•	Locality	Cowardin Class.	нис	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Area	05	VA	R6	02080106	2/2/2016			
Name	e(s) of Evaluator(s)	Stream Nam	e and Informa	ation					
	D. Mitchell				05-S1	ΓR-06		•	

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Cor	nditional Cate	gory				NOTES>>		l
	Optimal	Subo	ptimal	Mar	ginal	Po	oor	Right banl	c = strip of	l
Riparian Buffers	Tree stratum (dbh > 3 inches) pre with > 60% tree canopy cover an non-maintained understory. Wetl areas.	an to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	row crops, active feed lots, trails, or other comparable conditions.	wood then Field Shee STM-11.	road.	
		High	Low	High	Low	High	Low			l
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5			
	arian areas along each stream	bank into Condition C	Categories and Co	ondition Scores us	sing the	Ensure	the sums			l
descriptors. 2. Determine sq below.	uare footage for each by mea	uring or estimating le	ength and width.	Calculators are pr	ovided for you	of % F	Riparian			1
3. Enter the % F	Riparian Area and Score for ea	ch riparian category i	n the blocks below	w.		Blocks 6	equal 100			l
Right Bank	% Riparian Area> 30%	70%					100%			l
Nigin Dalik	Score > 1.2	0.5								ı
								CI= (Sum % RA * \$	,	
Left Bank	% Riparian Area> 100%						100%	Rt Bank CI >	0.71	L
zo zum	Score > 1.2							Lt Bank CI >	1.20	П

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> 0.48

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:



Project/Site: DC2RVA - Area 05

NC DWQ Stream Identification Form Version 4.11

Date: 2/2/2016

05-STR-06

Latitude: 37.800284

Evaluator: D. Mitchell  Total Points: 15.5	County: Hanove	nation (circle one)	Longitude: -77	.4009420
Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		rmittent Perennial	e.g. Quad Name:	
A. Geomorphology (Subtotal = 6)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	<b>(1)</b>	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits		1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	( No	0 = 0	Yes :	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 6)		_		
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	) = 0	Yes:	= 3
C. Biology (Subtotal = $3.5$			$\overline{}$	
18. Fibrous roots in streambed	3	2	<u>(1)</u>	0
19. Rooted upland plants in streambed	3	2	<u> </u>	0
20. Macrobenthos (note diversity and abundance)	2	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish		0.5	1	1.5
23. Crayfish		0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	
*perennial streams may also be identified using other met	-			
Notes: Flows from under rail along south side of	of Ellott Crossing Rd.	Field Sheet: 13-A-	STM-11.	
Sketch: Culvert 1	1 Strea	am 11 🔻	Ľ,	

Ellott Crossing

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Impact Cowardin Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 05 02080106 2/2/2016 Stream Name and Information Name(s) of Evaluator(s) 05-STR-07 D. Mitchell 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** Optimal Suboptimal Marginal Field Sheet Stream Low Marginal: Non-maintained, High Poor: Lawns, mowed 12- Ephemeral ligh Suboptima High Marginal: Riparian areas ense herbaceou Channel. Riparian areas and maintained Low Poor: vegetation, riparian areas acking shrub and with tree stratur Non-maintained with tree stratum (dbh > 3 inches) reas, nurseries (dbh > 3 inches ense herhaceou no-till cropland vegetation with either a shrub present, with Free stratum (dbh > 3 inches) preser spoil lands, resent, with 30% to 60% tree actively grazed Riparian 30% tree canon tree stratum, hav pasture, sparsely vegetated non-maintained area, with > 60% tree canopy cover and ar enuded surface cover and a maintained roduction, ponds open water. If laver or a tree canopy cover an containing both row crops, active eed lots, trails, or **Buffers** on-maintained understory. Wetland layer (dbh > 3 inches) present, understory present, tree herbaceous and recently seeded ther comparable Recent cutove with <30% tree stratum (dbh >3 shrub layers or a non-maintained and stabilized, o conditions. (dense vegetation). canopy cover. inches) present, with <30% tree understory canopy cover with maintained High High High Low Low Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank 1.5 Score > CI= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > 1.50 CI Left Bank 1.50 Lt Bank CI > 1.50 Score > 1.5 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH 0.75

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

INSERT PHOTOS:



Project/Site: DC2RVA - Area 05

NC DWQ Stream Identification Form Version 4.11

Date: 2/2/2016

05-STR-07

Latitude: 37.796023

Evaluator: D. Mitchell	County: Hanove	er County	Longitude: -77	7.470790
Total Points: 11.5		nation (circle one)	Other	
Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Ephemeral Inter	mittent Perennial	e.g. Quad Name:	
•				
A. Geomorphology (Subtotal = 8.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0		2	3
2. Sinuosity of channel along thalweg	0	$\odot$	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes :	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 1				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes :	= 3
C. Biology (Subtotal = $\frac{2}{2}$ )			_	
18. Fibrous roots in streambed	3	2	<u>(1)</u>	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)		1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish		0.5	1	1.5
23. Crayfish		0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	
*perennial streams may also be identified using other met	thods. See p. 35 of manual			
Notes: Field Sheet: Stream 12, Ashland.				
Sketch:				
	de	eply incised		

ballast Railroad

A DC2RVA - Area 05 VA R6 02080106 2/2/2016	DC2RVA - Area 05 VA R6 02080106 2/2/2016	DC2RVA - Area 05	A DC2RVA - Area 05 VA R6 02080106 2/2/2016 D. Mame(s) of Evaluator(s)  D. Mitchell  O5-STR-08  ARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Righs suboptimal Righs are areas with the stitutum of the structure of t	A DC2RVA - Area 05 VA R6 02080106 2/2/2016	DC2RVA - Area 05 VA R6 02080106 2/2/2016						lethodology f					
Name(s) of Evaluator(s)  D. Mitchell  O5-STR-08  ARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal  Name (a) Optimal  Name (b) Optimal  Nother (continued)  Nother (cont	DC2RVA - Area 05 VA R6 02080106 2/2/2016	DC2RVA - Area 05 VA R6 02080106 2/2/2016	Name(s) of Evaluator(s)  D. Mitchell  O5-STR-08  ARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal  High Suboptimal  High Suboptimal  High Marginal: Non-maintained with 1 (but Watginal: Non-maintained with 1 (but Suboptimal wi	Name(s) of Evaluator(s)  D. Mitchell  O5-STR-08  ARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Low Suboptimal High Marginal Registrion eries with research with res	DC2RVA - Area 05  Name(s) of Evaluator(s)  D. Mitchell  Stan BUFFERS: Assess both barks 100 tool risdram areas along the series SAR. (rough measurements of length 5 with may be acceptable)  Conditional Category  Conditional Category  Ingh Suboptimal  Ingh Subop	roject #		Project Name	•	Locality		HUC	Date	SAR#		
ARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)    Conditional Category	AN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)    Conditional Category	Conditional Category	ARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)    Conditional Category	ARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)    Conditional Category	D. Mitchell  Optimal Suboptimal Wigh Recognized William Recognized Wil	Ά	DC	2RVA - Area	05	VA		02080106	2/2/2016			
Conditional Category  Optimal Suboptimal Warginal Lew Suboptimal Ripid Sub	Conditional Category  Optimal Suboptimal High Suboptimal Riparian areas with tree stratum (bb) > 3 inches) present, with + 30% tree anony cover and non-maintained understory. Wellands areas.  High Low High Desert, with + 30% tree anony cover and non-maintained understory. Wellands areas anony-maintained understory well areas and some short because which the strategory and non-maintained understory. Wellands areas anony-maintained understory well areas and some short because which the strategory over and a maintained understory. Wellands areas anony-maintained understory well areas and some short because which and tree stratum (bb) > 3 inches) present, with possible with the strategory over and a maintained understory. Wellands areas anony-maintained understory well areas and some short because which and tree stratum, expetited non-maintained understory. Wellands areas anony-maintained understory. Wellands areas anony-maintained understory. Wellands areas and some short because which are strategory of the	Conditional Category  Optimal  Suboptimal  High Suboptimal  High Suboptimal  High Suboptimal  High Suboptimal  High Suboptimal  Normalianand, Riparian areas with tree stratum (dbh - 3 inches) present, with your stratum of the 2 decimal places. The CR should be rounded to 2 decimal places. The CR should be rounded to 2 whole number.  Conditional Category  Optimal  Suboptimal  High Suboptimal  High Suboptimal  High Suboptimal  Riparian areas with tree stratum (dbh - 3 inches) present, with your present,	Conditional Category  Optimal Suboptimal High Suboptimal Riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal High Suboptimal Riparian areas with tree stratum (dbh > 3 inches) present with the stratum (dbh > 3 inches) present with stratum (dbh > 3 i	Conditional Category  Optimal Suboptimal High Suboptimal Riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal High Suboptimal Riparian areas with tree stratum (dbh > 3 inches) present with the stratum (dbh > 3 inches) present with stratum (dbh > 3 i	Conditional Category  Conditional Category  Suboptimal  With Suboptimal  Right Subop	Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation					
Optimal   Suboptimal   High Suboptimal   High Marginal Reparts a reas with tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands areas.   High Marginat enemony with > 60% tree canopy cover and a non-maintained understory.   Wetlands areas.   High Marginat enemony expension areas with tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory.   Wetlands areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   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Recent Culvery (chers)   Present, with > 30% tree canopy cover and containing both herbacoous and shrub layers.   Recent Culvery (chers)   Present, with > 30% tree canopy cover and containing both herbacoous and shrub layers.   Recent Culvery (chers)   Present, with > 30% tree canopy cover and containing both herbacoous and shrub layers.   Recent Culvery (chers)   Present, with > 30% tree canopy cover with   Present Present, with > 30% tree canopy cover with   Present Present, with > 30% tree canopy cover with   Present Present, with > 30% tree canopy cover with   Present Present, with > 30% tree canopy cover with   Present Present, with > 30% tree canopy cover with   Present Present, with > 30% tree canopy cover with   Present Pres	Optimal Suboptimal Low Suboptimal Low Marginal NoTES>> Field Sheet: 13-A-STRM-18.    High Suboptimal Righarian areas with tree stratum (dob > 3 inches) present with objection and non-maintained understory. Wellands areas.   High Marginal content of the canopy cover and a non-maintained understory.   Wellands areas and non-maintained understory.   Wellands areas areas   High Low   Hi	Optimal   Suboptimal   High Suboptimal   High Marginal Reparts a reas with tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands areas.   High Marginat enemony with > 60% tree canopy cover and a non-maintained understory.   Wetlands areas.   High Marginat enemony expension areas with tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory.   Wetlands areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   High Marginat enemony expension areas.   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Optimal Suboptimal High Suboptimal Riparan areas Riparan areas with tree stratum (bh > 3 inches) present, with suboptimal (bh > 3 inches) present, with suboptimal (bh > 3 inches) present, with suboptimal (bh > 3 inches) present, with suboptimal (bh > 3 inches) present, with suboptimal (bh > 3 inches) present, with suboptimal (bh > 3 inches) (bh > 3	Conditional Category   Suboptimal   Suboptimal   Suboptimal   Suboptimal   High Suboptimal   High Suboptimal   Reparan areas with ree stratum (bith > 3 inches) present, with > 60% tree canopy cover and containing both herbaceous and shrub layers or a tree and non-maintained understory. Wetlands areas.   High Suboptimal   Reparan areas with ree stratum, with > 60% tree canopy cover and containing both herbaceous and shrub layers or a tree and shrub layers or a tree and non-maintained understory.   Repetration   Software canopy cover and containing both herbaceous and shrub layers or a tree and shrub layers or a tree and shrub layers or a tree and shrub layers or a tree and shrub layers or a tree and the stratum, have canopy cover and containing both herbaceous and shrub layers or a tree and tree and tree and tree and tree and tree and tree and tree and tree and tree and t	Optimal Suboptimal Low Suboptimal Low Suboptimal High Suboptimal Repartin areas with tree stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present with the stratum (dob > 3 inches) present (dos on the stratum (dob > 3 inches) present	Optimal Suboptimal High Suboptimal Riparan areas Riparan areas with tree stratum (bh > 3 inches) present, with suboptimal (bh > 3 inches) present, with suboptimal (bh > 3 inches) present, with suboptimal (bh > 3 inches) present, with suboptimal (bh > 3 inches) present, with suboptimal (bh > 3 inches) present, with suboptimal (bh > 3 inches) (bh > 3	Optimal Suboptimal High Suboptimal Riparan areas Riparan areas with tree stratum (bh > 3 inches) present, with suboptimal (bh > 3 inches) present, with suboptimal (bh > 3 inches) present, with suboptimal (bh > 3 inches) present, with suboptimal (bh > 3 inches) present, with suboptimal (bh > 3 inches) present, with suboptimal (bh > 3 inches) (bh > 3	Conditional Category    Company	RIAN	N BUFFERS: A	ssess both bank	's 100 foot riparia	an areas along the	e entire SAR (roi	igh measurement	ts of length & wid	th may be accen	table)	
Comparison   Com	Comparison   Com	Optimal Suboptimal High Suboptimal Riparian areas Marginal High Marginal: New Suboptimal Riparian areas with tree stratum (dbh > 3 inches) present, with sh. 60% tree canopy cover and an non-maintained understory. Wetlands on-maintained understory.  In the stratum (dbh > 3 inches) present, with sh. 60% tree canopy cover and an non-maintained understory. Wetlands on-maintained understory.  In the stratum (dbh > 3 inches) present, with sh. 60% tree canopy cover and an on-maintained understory. Wetlands on-maintained understory.  In the stratum (dbh > 3 inches) present, with sh. 60% tree canopy cover and an on-maintained understory.  In the stratum (dbh > 3 inches) present, with layer or a free with a shrub	Comparison   Com	Comparison   Com	Optimal Suboptimal right Suboptimal righ			looded bour barn.	<u> </u>		,	.9.1 1110404101110111	to or longer a ma	armay 20 accep	,	
High Suboptimal, Righrian areas with tree stratum, with > 60% tree canopy cover and an non-maintained defeated understory. Wetlands areas.  It is a suboptimal tree stratum, with > 60% tree canopy cover and an non-maintained defeated understory. Wetlands areas.  It is a suboptimal tree stratum, with > 60% tree canopy cover and an non-maintained defeated understory. Wetlands areas.  It is a suboptimal tree stratum, with > 60% tree canopy cover and an shrub layers or a non-maintained dunderstory.  It is a suboptimal tree stratum, with > 60% tree canopy cover and an shrub layers or a non-maintained dunderstory.  It is a suboptimal tree stratum, with > 60% tree canopy cover and an shrub layers or a non-maintained defeated understory.  It is a suboptimal tree stratum, with > 60% tree canopy cover and an shrub layers or a non-maintained defeated understory.  It is a suboptimal tree stratum, with > 60% tree canopy cover and an shrub layers or a non-maintained defeated understory.  It is a suboptimal tree stratum, with > 60% tree canopy cover and an shrub layers or a non-maintained defeated understory.  It is a suboptimal tree stratum, with > 60% tree canopy cover and an shrub layers or a non-maintained defeated and shrub layers or a non-maintained defeated understory.  It is a suboptimal tree stratum, with > 60% tree canopy cover and an shrub layers or a non-maintained defeated understory.  It is a suboptimal tree stratum, with > 60% tree canopy cover and an on-maintained defeated understory.  It is a suboptimal tree stratum, with > 60% tree canopy cover.  It is a suboptimal tree stratum, with > 60% tree canopy cover.  It is a suboptimal tree stratum, with > 60% tree canopy cover.  It is a suboptimal tree stratum, with > 60% tree canopy cover.  It is a suboptimal tree stratum, with > 60% tree canopy cover.  It is a suboptimal tree stratum, with > 60% tree canopy cover.  It is a suboptimal tree stratum, with > 60% tree canopy cover.  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Wetlands areas.  High Marginat: High Marginat: Rigarian areas with tree stratum, with > 60% tree canopy cover and a non-maintained understory. Wetlands areas.  High Marginat: High Marginat: Rigarian areas with tree stratum, Non-maintained, with > 60% tree canopy cover and a non-maintained understory.  High Low High Low High Low High Low Cearnous and shub layers or a non-maintained understory.  High Low High Low High Low High Low Cearnous with 20% tree dampy cover with maintained understory.  High Low High Low High Low Cearnous with 20% tree dampy cover with maintained understory.  The square footage for each by measuring or estimating length and width. Calculators are provided for you sover > 1.5  Requirement of the provided for you with 20% tree canopy cover with maintained understory.  We Riparian Areas along each stream bank into Condition Categories and Condition Scores using the example of the comparable with 20% tree canopy cover with maintained understory.  We Riparian Areas along each stream bank into Condition Categories and Condition Scores using the example of the comparable with 20% tree canopy cover with maintained understory.  We Riparian Areas along each stream bank into Condition Categories and Condition Scores using the example of the comparable with 20% tree canopy cover with maintained understory.  We Riparian Areas along each stream bank into Condition Categories and Condition Scores using the example of the condition Scores using the sequence of the condition Scores using the sequence of the condition Scores using the sequence of the condition Scores of the condition Scores using the sequence of the condition Sc	High Suboptimat, Righarian areas with tree stratum, with 5 60% tree canopy cover and an non-maritained understory. Wetlands areas.  High Suboptimat, Righarian areas with tree stratum, with 5 60% tree canopy cover and an non-maritained understory. Wetlands areas.  High Low High Low High Low High Low High Low High Low High Low with an inches) present, with 20% tree canopy cover and an shrub layers or a non-maritained understory. Wetlands areas.  High Low High Low High Low High Low High Low High Low sprain areas along each stream bank into Condition Categories and Condition Scores using the straining square footage for each by measuring or estimating length and width. Calculators are provided for you Score > 1.5  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >> CCM ERCI X LF X IF	High Suboptimal: Repartion areas with tree stratum, with 50% tree canopy cover and an non-maintained derstory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with 30% tree canopy cover and an non-maintained derstory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with 30% tree canopy cover and an non-maintained derstory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with 30% tree canopy cover and an anon-maintained derstory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with 30% tree canopy cover and an anon-maintained derstory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with 30% tree canopy cover and an anon-maintained derstory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with 30% tree canopy cover and an anon-maintained derstory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with 30% tree canopy cover and an anon-maintained derstory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with 30% tree canopy cover and an anon-maintained derstory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with 30% tree canopy cover, with 430	High Subjective in the street of the street		Opti	mal				, .	Po	or		: 13-A-
tion es	1.5 1.2 1.1 0.85 0.75 0.6 0.5  Inparian areas along each stream bank into Condition Categories and Condition Scores using the square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian    Riparian Area and Score for each riparian category in the blocks below.   Blocks equal 100	1.5 1.2 1.1 0.85 0.75 0.6 0.5  In priparian areas along each stream bank into Condition Categories and Condition Scores using the set square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Area and Score for each riparian category in the blocks below.    We Riparian Area and Score for each riparian category in the blocks below.   Blocks equal 100	tion es	tition res	the stand CI should be rounded to 2 decimal pieces. The CR should be rounded to a whole number.  1.5	arian fers	with > 60% tree can non-maintained und	nopy cover and an derstory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh -3 inches) present, with <30% tree canopy cover with maintained understory.	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces row crops, active feed lots, trails, or other comparable conditions.	STRM-18.	
ank	inparian areas along each stream bank into Condition Categories and Condition Scores using the square footage for each by measuring or estimating length and width. Calculators are provided for you blocks equal 100    Repartian Area and Score for each riparian category in the blocks below.   Blocks equal 100	riparian areas along each stream bank into Condition Categories and Condition Scores using the le square footage for each by measuring or estimating length and width. Calculators are provided for you should be rounded to 2 decimal places. The CR should be rounded to a whole number.    Respect	ank Riparian Area 100% Score > 1.5  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  CIS and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  Ensure the sums of % Riparian Blocks equal 100  Blocks equal 100  CI= (Sum % RA * Scores*0.01)/2  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	res date riparian areas along each stream bank into Condition Categories and Condition Scores using the rate riparian areas along each stream bank into Condition Categories and Condition Scores using the rate riparian areas along each stream bank into Condition Categories and Condition Scores using the rate riparian areas along each stream bank into Condition Categories and Condition Scores using the rate of % Riparian Area and Score for each riparian category in the blocks below.    Socre   1.5	regarden areas along each stream bank into Condition Categories and Condition Scores using the parama areas along each by measuring or estimating length and width. Calculators are provided for you of % Ripartian and Score for each ripartian category in the blocks below.    Socre > 1.5	dition	1	5	-				Ū			
inine square footage for each by measuring or estimating length and width. Calculators are provided for you he % Riparian Area and Score for each riparian category in the blocks below.    Main   Mai	square footage for each by measuring or estimating length and width. Calculators are provided for you    Riparian Area and Score for each riparian category in the blocks below.	the square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian    % Riparian Area and Score for each riparian category in the blocks below.     % Riparian Area   100%   100%     % Riparian Area   100%   100%     % Riparian Area   100%   100%     % Riparian Area   100%   100%     % Riparian Area   100%   Rt Bank Cl > 1.50     % Riparian Area	rinie square footage for each by measuring or estimating length and width. Calculators are provided for you the % Riparian Area and Score for each riparian category in the blocks below.    Score   1.5	rs. nine square footage for each by measuring or estimating length and width. Calculators are provided for you the % Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100    Maintain Area   100%	no equate footage for each by measuring or estimating length and width. Calculators are provided for you go with the blocks below.    Sk Riparian Areas   100%	res eate rina										
Sank   % Riparian Area   100%   100%	% Riparian Area   100%   100%	We Riparian Area   100%   100%   100%	Mark   Mark	Score   Scor	INK Sories 1.5 CIT (Sum % RA* Socries* 0.01)/2  NK Paparian Areas 100% Sories 1.5 Lit Bank CI > 1.50  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) > RCI (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) > CR = RCI X LF X IF  PHOTOS:	ors.	•			•		•				
Score   Scor	Score   Scor	Score   1.5   Cl= (Sum % RA * Scores*0.01)/2	Score   Scor	Score   1.5	Score > 1.5   Cle (Sum % RA * Scores*0.01)/2  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  PHOTOS:	er the % F	Riparian Area and	Score for each ri	parian category in	n the blocks below	v.		Blocks 6	qual 100		
Cl= (Sum % RA * Scores*0.01)/2  ank	CI= (Sum % RA * Scores*0.01)/2    Repartian Area   100%   Rt Bank CI >   1.50	Cl= (Sum % RA * Scores*0.01)/2  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	CI= (Sum % RA* Scores*0.01)/2  Tank    % Riparian Area   100%   Rt Bank CI >   1.50	C = (Sum % RA * Scores*0.01)/2	Separation Areas   100%   Rt Bank Cl >   1.50	Bank								100%	4	
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	Score > 1.5  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	Score > 1.5  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCl) >>  RCl= (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCl X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) > RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) > CR = RCI X LF X IF  PHOTOS:		Score >	1.0							CI= (Sum % RA * So	ores*0.01)/2
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  PHOTOS:											
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COMPENSATION REQUIREMENT (CR) >:  CR = RCI X LF X IF	COMPENSATION REQUIREMENT (CR) >:  CR = RCI X LF X IF	COMPENSATION REQUIREMENT (CR) >:  CR = RCI X LF X IF	COMPENSATION REQUIREMENT (CR) >:  CR = RCI X LF X IF	COMPENSATION REQUIREMENT (CR) >:  CR = RCI X LF X IF	COMPENSATION REQUIREMENT (CR) >:  CR = RCI X LF X IF  PHOTOS:		Score >	1.5 REACH C				NDITION UN	ITS FOR TH	IS REACH	Lt Bank CI >	1.50
					PHOTOS:		Score >	1.5 REACH C				NDITION UN	ITS FOR TH	IS REACH	Lt Bank CI >	1.50 EX (RCI) >>
					IE PROPOSED IMPACT:	s and F	Score >	1.5 REACH C				NDITION UN		IS REACH THE REACH	Lt Bank CI >  CONDITION IND  CI= (Riparian CI)  ION REQUIREM	1.50 EX (RCI) >>
					22 1 NO. COLD MIL ACT.		Score >	1.5 REACH C				NDITION UN		IS REACH THE REACH	Lt Bank CI >  CONDITION IND  CI= (Riparian CI)  ION REQUIREM	1.50 EX (RCI) >>
IRE PROPOSED IMPACT:	PROPOSED IMPACT	E PROPOSED IMPACT:	IRE PROPOSED IMPACT:	IRE PROPOSED IMPACT		F PHC	Score >  RCI should be rounded  DTOS:	1.5 REACH C				NDITION UN		IS REACH THE REACH	Lt Bank CI >  CONDITION IND  CI= (Riparian CI)  ION REQUIREM	1.50 EX (RCI) >>

NC DWQ Stream Identification Form Version 4.11

05-STR-08

Date: 2/2/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.792489
Evaluator: D. Mitchell	County: Hanover County	Longitude: -77.471915
<b>Total Points:</b> 15 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral intermittent Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*	Epnemeral	rmittent Perenni	al e.g. Quad Name:	
A. Geomorphology (Subtotal = 6)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel		$\dot{0} = 0$	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = $5.5$ )				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	) = 0	Yes	= 3
C. Biology (Subtotal = $3.5$				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	(0)	1	2	3

21. Aquatic Mollusks 0.5 1.5 22. Fish 1 23. Crayfish 0.5 1 1.5 24. Amphibians 0.5 1 1.5 25. Algae 0 0.5 1.5

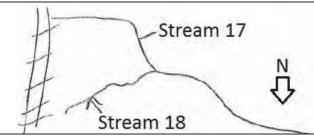
FACW = 0.75; OBL = 1.5 Other = 0

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet: 13-A-STRM-18.

26. Wetland plants in streambed

Sketch:



		Stre		fied Stream N	lethodology f	or use in Virg	ginia				
Project #		Project Name		wadeable chan	nels classified a Cowardin Class.	s intermittent or	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	05	VA	R2	02080106	2/2/2016		lengin	Factor	
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
	D. Mitchell					05-S	ΓR-09				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal c	onditional Catego	r <u>y</u> ginal	Po	or	Sev	ere	
	1	WAR TO THE REAL PROPERTY OF THE PERTY			less than Severe or	Overwiden		1	5		
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or full) bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to or newly develope portions of the r	tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow Il defined. Stream o bankfull benches, d floodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositiv stability, may be	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is inst. erosion. AND/OI stream is cover Sediment is temp nature, and contril AND/OR V-shapi	ority of both banks crosion present on ks. Vegetative nt on 20-40% of ffficient to prevent R 60-80% of the ab ysediment. orary/transient in puting to instability. ed channels have	incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank slc Erosion/raw ban AND/OR Aggrading	stability. Severe tained within the db elow average lajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%.	
	10% of			rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depor	ks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	uting to instability. channels and/or	C
Score		3	2	4	:	2	1.	6	1		1
NOTES>>	A PHEEDS.	A   b - sh   b - ss	d- 400 ft vi vi-		- anti-a CAD (no.		to of love the O wind		4-h-1-)		
	N BUFFERS: /	Assess both bank	Con	an areas along the ditional Cateo ptimal	gory	ugh measuremen	ts of length & wid		notes>>		
	Opti Tree stratum (dbh: with > 60% tree ca	imal > 3 inches) present, anderstory. Wetlands	Con	ditional Cate	gory						
2. RIPARIAI Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cr. non-maintained un	imal > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cateceptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
2. RIPARIAI	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Categorium Low Suboptimal:  Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory.  Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 22. Determine so below.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of t	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categories and Congth and width. Categories and Congth and width. Categories and with the stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums iparian qual 100			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 22. Determine so below.	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categories and Congth and width. Categories and Congth and width. Categories and with the stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate rip descriptors. Deltermine scoelow. Enter the % l	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of t	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categories and Congth and width. Categories and Congth and width. Categories and with the stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums iparian qual 100		cores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate rip descriptors. Deltermine scoelow. Enter the % l	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each ri  100%  1.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Categories and Congth and width. Categories and Congth and width. Categories and with the stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums iparian qual 100	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	1.50	C
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % Right Bank Left Bank 3. INSTREAL	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.5  100% 1.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. (	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si		C 1.5
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % Right Bank Left Bank 3. INSTREAL	Tree stratum (dbh: with > 60% tree ca non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Score >  W HABITAT: Va root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each of 100%  1.5  100%  1.5  aried substrate si iffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t     of % R     Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 1005  Low 1007  Low 1009  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.50	
Condition Scores  1. Delineate rip descriptors. 22. Determine so below. 3. Enter the % Right Bank Left Bank 3. INSTREAl undercut banks;	Tree stratum (dbh: with > 60% tree conon-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> core >  M HABITAT: Wood mats; SAV; r  Opti Habitat elements a	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.5  100% 1.5  aried substrate si iffle poole completimal  re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	ditional Categoritmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditional  ments are typically who free reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically % of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % Reserved Blocks estable Blocks	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.50	
Condition Scores Delineate rip descriptor Delineate rip descriptor	Tree stratum (dbh: with > 60% tree cz non-maintained un- located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Vi root mats; SAV; r  Opti  Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.5  100% 1.5  aried substrate si iffle poole completimal  re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in the containing le parian category in the category in the containing le parian category in the containing le parian category in the containing le parian category in the category in the category in the category in the category in the category in the category in t	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. ( In the blocks below  ty and depths; wo res.  Conditiona ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nes/">https://doi.org/10.100/j.nes/</a> High 0.85  I Calculators are provided and leafy detail Category  War.  Stable habitat ele present in 10-309 are adequate for a for a	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.50	

	St	ream In	npact A	ssessm	ent For	m Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	csx		VA	R2	02080106	2/2/2016	05-STR-09			
4. CHANNEL	L ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of ch	nannel, channeliz	zation,	NOTES>>		
embankments, s	poil piles, constrictions, livestock		Conditiona							
	Negligible	Mi	nor		erate	Sev	vere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	disrupted by an alterations listed guidelines AND/0	50% of reach is y of the channel in the parameter DR 80% of banks ubion, riprap, or tent.			CI
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			1.30
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IIS REACH			
NOTE: The CIs and R	RCI should be rounded to 2 decimal places. T	he CR should be roun	ided to a whole number	er.				CONDITION IN		
					İ			I= (Sum of all C		0
					ļ			ON REQUIRE	WENT (CK) >>	0
INSERT PHO	TOS:						0.1.			·
DESCRIBE F	PROPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11

05-STR-09

Date: 2/2/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.792229
Evaluator: D. Mitchell	County: Hanover County	Longitude: -77.471949
<b>Total Points:</b> 34.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

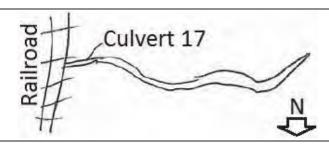
if ≥ 19 or perennial if ≥ 30*	Ephemeral inter	Ephemeral intermittent Perenman e.g. Quad Name:					
A. Geomorphology (Subtotal = 16 )	Absent	Weak	Moderate	Strong			
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3			
Sinuosity of channel along thalweg	0	1	(2)	3			
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3			
Particle size of stream substrate	0	1	(2)	3			
5. Active/relict floodplain	0		2	3			
6. Depositional bars or benches	0	1	2	3			
7. Recent alluvial deposits	0	1	2	3			
8. Headcuts	0	1	2	3			
9. Grade control	0	0.5	1	1.5			
10. Natural valley	0	0.5	1	1.5			
11. Second or greater order channel	No	= 0	Yes	= 3			
<sup>a</sup> artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 9.5)							
12. Presence of Baseflow	0	1	2	(3)			
13. Iron oxidizing bacteria	0	1	(2)	3			
14. Leaf litter	(1.5)	1	0.5	0			
15. Sediment on plants or debris	0	0.5	1	1.5			
16. Organic debris lines or piles	0	0.5	1	1.5			
17. Soil-based evidence of high water table?	No	= 0	Yes	= 3			
C. Biology (Subtotal = 9							
18. Fibrous roots in streambed	3	(2)	1	0			
19. Rooted upland plants in streambed	3	(2)	1	0			

5. Biology (Castotal - <u> )</u>				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	1)	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; C	OBL = 1.5 Other = 0	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet: 13-A-STRM-17.

Sketch:



		Stre					(For	m 1)			
				fied Stream N wadeable chan							
Project #		Project Name		Locality	Cowardin Class.	нис	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	05	VA	R2SB4	02080106	2/2/2016				
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation		l				
	D. Mitchell					05-S	ΓR-10				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream		ondition (erosion,						
	Opt	imal	Subo	ptimal		ginal	Po	or	Sev	ere	
	7	AND PARKET			Often incised, but	less than Severe or	Overwiden	ed/incised.	1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point barsa are present. Acce floodplain or fully	n or natural rock, 00%). AND/OR bankfull benches ess to their original	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches,	or Poor due to lo Erosion may be pro both banks. Veget 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/Of stream is covere Sediment is temp	ority of both banks Erosion present on ks. Vegetative nt on 20-40% of difficient to prevent R 60-80% of the ed by sediment. corary/transient in	incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank slo	stability. Severe tained within the d below average ajority of banks ut. Vegetative in less than 20% of venting erosion. Bughing present.	
	and transverse ba	ars few. Transient on covers less than	portions of the r sediment cover	d floodplains along reach. Transient rs 10-40% of the bottom.	stability, may be AND/OR V-shap vegetative protecti banks and depositi	on that contribute to forming/present. ed channels have ion on > 40% of the ional features which to stability.	nature, and contrib AND/OR V-shape vegetative protecti 40% of the bar sediment depos	ed channels have on is present on > nks and stable	Erosion/raw ban AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	channel. Greater bed is covered by uting to instability. channels and/or	С
Score	3	3	2	.4	;	2	1.	.6	1		
NOTES>>				Fid	eld Sheet 1	3-A-STRM-	16.				
2. RIPARIAN	N BUFFERS: /	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	th may be accep	table)		
	1			ditional Cate			_		NOTES>>		
Riparian Buffers	with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <ago bear="" canopy="" cover="" maintained="" th="" understory.<="" with=""><th>High Poor: Lawns, nowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.</th><th>Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.</th><th></th><th>stream mately 90'</th><th></th></ago>	High Poor: Lawns, nowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		stream mately 90'	
			High	Low	High	Low	High	Low			
Condition Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
Delineate ripa descriptors.     Determine so pelow.	arian areas along quare footage for e	each by measurin	g or estimating le	ngth and width. (	Calculators are pr		Ensure to	liparian qual 100			
Right Bank	% Riparian Area>	80% 1.5	20% 0.6					100%	<u> </u>		
	l	000/	200/					4000/	CI= (Sum % RA * S	,	
Left Bank	% Riparian Area>	80% 1.5	20% 0.6					100%	Rt Bank CI >	1.32 1.32	1.3
	M HABITAT: Va	aried substrate si	zes, water velocit			oris; stable substr	ate; low embeded	lness; shade;	NOTES>>		113
Instream	Opt	imal	Subo	ptimal		ginal	Po	or			
Habitat/ Available	Habitat elements a	re typically present	Stable habitat eler present in 30-50%	ments are typically % of the reach and	Stable habitat ele present in 10-30%	ments are typically % of the reach and or maintenance of	Habitat elements		]		
	in greater than 5	0% of the reach.	are adequate fo	i maintenance oi	are adequate to	i maintenance or	elements are typica	any present in less			-
Cover	_	.5	popul	ations.	popul	ations.	than 10% o	f the reach.	-		C 1.2

	St	ream In	npact A	ssessm	ent For	m Pag	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB4	02080106	2/2/2016	05-STR-10		
	CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, abankments, spoil piles, constrictions, livestock  Conditional Category								
	Negligible	Mi	nor	Mode	erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel alterations listed in	is disrupted by any of the channel	Greater than 8 disrupted by an alterations listed guidelines AND/0 shored with ga	30% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or nent.		
				recovered.	recovered.				

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

INSERT PHOTOS:



Top Left: View downstream toward Culvert 16 Top Right: View downstream in gas ROW

Bottom Left: View upstream
Bottom Right: View of brick Culvert 16, tributary to Falling Creek

NC DWQ Stream Identification Form Version 4.11

05-STR-10

Date: 2/2/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.787675
Evaluator: D. Mitchell	County: Hanover County	Longitude: -77.473145
<b>Total Points:</b> 34.5 Stream is at least intermittent if ≥ 19 or perennial if ≥ $30^*$	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*							
A. Geomorphology (Subtotal = 16)	Absent	Weak	Moderate	Strong			
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3			
2. Sinuosity of channel along thalweg	0	1	(2)	3			
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3			
4. Particle size of stream substrate	0	1	(2)	3			
5. Active/relict floodplain	0		2	3			
6. Depositional bars or benches	0	(1)	2	3			
7. Recent alluvial deposits	0	<b>(1)</b>	2	3			
8. Headcuts	0	1	2	3			
9. Grade control	0	0.5	1	1.5			
10. Natural valley	0	0.5	1	1.5			
11. Second or greater order channel	No	= 0	(Yes = 3)				
<sup>a</sup> artificial ditches are not rated; see discussions in manual			<u> </u>				
B. Hydrology (Subtotal = $9$							
12. Presence of Baseflow	0	1	2	(3)			
13. Iron oxidizing bacteria	0	1	2	3			
14. Leaf litter	1.5	1	0.5	0			
15. Sediment on plants or debris	0	0.5	1	1.5			
16. Organic debris lines or piles	0	0.5	1	1.5			
17. Soil-based evidence of high water table?	No	= 0	Yes = 3				
C. Biology (Subtotal = 9.5 )							
18. Fibrous roots in streambed	3	(2)	1	0			
19. Rooted upland plants in streambed	3	(2)	1	0			
20. Macrobenthos (note diversity and abundance)	0	<u> </u>	2	3			
21. Aquatic Mollusks	0	1)	2	3			
22 Fish	0	0.5	1	1.5			

22. Fish (0.5)1.5 23. Crayfish 0 0.5 1.5 24. Amphibians 0 0.5 1.5 25. Algae 0 0.5 1.5 FACW = 0.75; OBL = 1.5 Other = 0 26. Wetland plants in streambed

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet: 13-A-STRM-16.

Sketch:

Stream 16 Culvert 16

Riparian  Buffers    Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands areas.   High Margina! Riparian areas with tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands areas.   High Margina! Non-maintained, dense herbaceous vegetation, present, with > 60% tree canopy cover and a non-maintained understory. Wetlands areas.   High Margina! Non-maintained, dense herbaceous vegetation, present, with > 60% tree canopy cover and a non-maintained understory. Wetlands areas.   High Margina! Non-maintained, dense herbaceous vegetation, present, with + 30% tree canopy cover and a non-maintained understory. Recent cutover with maintained area, recently seed and stabilized, or other comparable condition.   Scores   1.5   1.2   1.1   0.85   0.75   0.6   0.5    Condition Scores   1.5   1.2   1.1   0.85   0.75   0.6   0.5    Delienate riparian areas along each stream bank into Condition Categories and Condition Scores using the escriptors.   Determine square footage for each by measuring or estimating length and width. Calculators are provided for you elow.   Enter the % Riparian Area and Score for each riparian category in the blocks below.   Stream in the province of the condition of the present of the present, with soft the canopy cover with maintained, dense herbaceous vegetation, non-timatianed, dense herbaceous vegetation, present, with soft the stratum, (dbh > 3 inches) present, with soft the canopy cover with maintained area, rurseries; no-till cropland; acking shrub and stabilized, or other comparable condition.   The present of the present of the present, with soft the stratum, didh > 3 inches) present, with soft the stratum, didh > 3 inches) present, with soft the stratum, didh > 3 inches) present, with soft the stratum, didh > 3 inches) present, with soft the stratum didh soft the stratum didh soft the stratum didh soft the stratum didh soft the stratum didh soft the stratum didh soft the stratum didh	Factor
N/A DC2RVA - Area 05 VA R6 02080106 2/2/2016  Name(s) of Evaluator(s) Stream Name and Information  D. Mitchell 05-STR-11  RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Riparian areas with tree stratum (dibh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.  Riparian areas.  Wetlands areas.  High Suboptimal: Riparian areas with tree stratum (dibh > 3 inches) present, with > 60% tree canopy cover and an shrub layers or a non-maintained understory. Wetlands areas.  High Marginal: High Morginal: Non-maintained width of the canopy cover and an shrub layers or a non-maintained understory.  High Marginal: Non-maintained width of the canopy cover and an shrub layers or a non-maintained understory.  High Marginal: Non-maintained width of the canopy cover and an shrub layers or a non-maintained understory.  High Marginal: Non-maintained width of the canopy cover and an shrub layers or a non-maintained understory.  High Marginal: Non-maintained width of the canopy cover and an shrub layers or a non-maintained understory.  High Marginal: Non-maintained width of the canopy cover and an shrub layers or a non-maintained understory.  High Marginal: Non-maintained width of the canopy cover and an shrub layer or a tree with a subject	eet: 13-A-
Name(s) of Evaluator(s)  D. Mitchell  O5-STR-11  RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal  Riparian areas with rest stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wellands areas.  Itiparian  Buffers  Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wellands areas.  Itiparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  NOTES>> Field Shc STRM 15  Low Buboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a non-maintained understory. Wellands areas.  Itiparian areas and structure areas.  Itiparian areas areas areas areas and structure areas.  Itiparian areas area	
Conditional Category  Optimal Suboptimal Riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Poor High Poor High Poor Innormalitation And the stratum (dbh > 3 inches) present, with 20% tree canopy cover and an non-maintained understory. Wetlands areas.  Wetlands areas.  Wetlands areas with the stratum (dbh > 3 inches) present, with 20% tree canopy cover and an shrub layers or a non-maintained understory.  High Marginal Riparian areas with tree stratum (dbh > 3 inches) present, with 20% tree canopy cover and an shrub layer or a tree and a maintained understory.  Wetlands areas.  Wetlands areas.  High Marginal Riparian areas with tree stratum (dbh > 3 inches) present, with 20% tree canopy cover and an shrub layer or a tree and a maintained understory.  Wetlands areas.  High Marginal Riparian areas with tree stratum (dbh > 3 inches) present, with 20% tree canopy cover with maintained understory.  Wetlands areas.  High Marginal Riparian areas with tree stratum (dbh > 3 inches) present, with 20% tree canopy cover with maintained understory.  Wetlands areas along each stream bank into Condition Categories and Condition Scores using the entermine square footage for each by measuring or estimating length and width. Calculators are provided for you with the stratum (dbh > 3 inches) present, registrating (dbh > 3 inches) present, with 30% tree canopy cover with maintained understory.  High Marginal Chow Marginal Chow and the stratum (dbh > 3 inches) present, with 20% tree stratum (dbh > 3 inches) present, with 30% tree canopy cover with maintained understory.  Wetlands areas along each stream bank into Condition Categories and Condition Scores using the entermine square footage for each by measuring or estimating length and width. Calculators are provided for you with the stratum (dbh > 3 inches) present, with 20% tree canopy cover with maintained understory.  Brown and tree stratum (dbh > 3 inches) present, with 20% tree canopy cover with maintained understory.  Brown and tree	
Conditional Category  Optimal  High Suboptimal Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and an non-maintained understory. Wetlands areas.  Iffers  Tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and an non-maintained understory.  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and an anon-maintained understory. Wetlands areas.  Iffers  Conditional Category  Marginal  Low Marginal: Non-maintained, clens herbaceous wegetation, with yes therbaceous and shrub layers or a tree (aleyer (dbh > 3 inches) present, with 30% tree canopy cover and an shrub layers or a non-maintained understory.  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and a maintained understory.  NOTES>>  Field She STRM 15  Low Marginal: Non-maintained, clens herbaceous and shrub layers or a tree (aleyer (dbh > 3 inches) present, with 30% tree canopy cover with 30% tree c	
Conditional Category  Optimal Suboptimal High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.  Iffers  Optimal Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.  If the stratum (dbh > 3 inches) present, with 30% tree canopy cover and an shrub layers or a ron-maintained understory.  If the stratum (dbh > 3 inches) present, with 30% tree canopy cover and a shrub layers or a non-maintained understory.  If the stratum (dbh > 3 inches) present, with 30% tree canopy cover and a shrub layers or a non-maintained understory.  If the stratum (dbh > 3 inches) present, with < 30% tree canopy cover and a shrub layers or a non-maintained understory.  If the stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  If the stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  If the stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  If the stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  If the stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  If the stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  If the stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  If the stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  If the stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  If the stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  If the stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  If the stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  If the stra	
High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands areas.  High Marginal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and a non-maintained understory. Wetlands areas.  High Marginal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and a non-maintained understory. Wetlands areas.  High Marginal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and a nanitained understory.  Wetlands areas.  High Marginal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and a nanitained understory.  Recent cutover (dense regetation).  Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover with maintained understory.  High Marginal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover with maintained understory.  High Marginal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover with maintained understory.  High Marginal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover with maintained understory.  High Marginal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover with maintained understory.  High Marginal: Riparian areas alcaking shrub and understory in expectate on on- maintained understory.  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover with maintained understory.  High Marginal: Riparian areas alcaking shrub and understory in expectate on on- maintained understory.  High Marginal: Riparian areas alcaking shrub and understory in expectate on on- maintained understory.  High Marginal: Riparian areas alcaking shrub and understory in expectate on the maintained understory.  High Marginal: Riparian areas alcaking shrub and understory in expectation with with <30% t	
High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory.  Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory.  Wetlands areas.  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a non-maintained understory.  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a non-maintained understory.  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a non-maintained understory.  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a non-maintained understory.  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a non-maintained understory.  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover with maintained understory.  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover with maintained understory.  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover with maintained understory.  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover with maintained understory.  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover with maintained understory.  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  High Suboptimal: Ripa	<b>.</b>
Condition Scores  1.5  1.2  1.1  0.85  0.75  0.6  0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the scriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you ow.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100	
Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the scriptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you low.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Enter the % Riparian Area and Score for each riparian category in the blocks below.	
oriptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you w.  Inter the % Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100	
1000/	
Right Bank         % Riparian Area>         100%           Score >         1.5	
	* Scores*0.01)/2
ft Bank   % Riparian Area   100%   Rt Bank Cl	
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH	
The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION I	· ,
RCI= (Riparian  COMPENSATION REQUIR	,
CR = RCI X LF X IF	
CORDIDE DRODOCED IMPACT.	
SURIDE PROPUSED IMPACT:	
ESCRIBE PROPOSED IMPACT:	

NC DWO Stream Identification Form Version 4.11

05-STR-11

Date: 2/2/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.778392
Evaluator: D. Mitchell	County: Hanover County	Longitude: -77.475722
<b>Total Points:</b> 14.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:
A. Geomorphology (Subtotal = 5	Absent Weak	Moderate Strong

if ≥ 19 or perennial if ≥ 30*			org. Quad riamos	
A 0	Abaast	WI-	BM a slavets	Ctma :: ::
A. Geomorphology (Subtotal = 5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	<b>(</b> 1 )	2	3
2. Sinuosity of channel along thalweg	(0)	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	۵		2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	N	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $5.5$		_		
12. Presence of Baseflow	0	1)	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	= 3

12. Presence of Baseflow	0		2	3	
13. Iron oxidizing bacteria	0)	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	No = 0		Yes = 3		
C. Biology (Subtotal = 4					

C. Biology (Subtotal = <u>4</u> )			^	
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	1)	0
20. Macrobenthos (note diversity and abundance)	<u> </u>	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other =	0

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet: 13-A-STRM-15.

Sketch:

Stream 15

		Stre			ment lethodology f		ı (For	m 1)			
					nels classified a						
Project #	P	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	05	VA	R2SB	02080106	2/2/2016				
Nam	e(s) of Evaluate	(s) of Evaluator(s) Stream Name and Information									
	D. Mitchell					05-S	ΓR-12				
. Channel (	Condition: Asses	ss the cross-sec	tion of the stream		ondition (erosion, onditional Categor						
	Optir	mal	Subo	ptimal		ginal	Po	or	Severe		
		WALLEY OF THE STATE OF THE STAT	Climbula instead &	ew areas of active		less than Severe or stable than Severe	Overwidend Vertically/laterally		1	5	
Channel Condition	Very little incision or 100% stable banl surface protection prominent (80-10 Stable point bars/b are present. Acces floodplain or fully bankfull benches. N and transverse bar sediment deposition	ks. Vegetative or natural rock, 0%). AND/OR ankfull benches is to their original developed wide did-channel bars, is few. Transient covers less than	erosion or unproted of banks are st Vegetative protect prominent (60-Depositional feat stability. The bar channels are wellikely has access to or newly develope portions of the r	ted banks. Majority lable (60-80%). ion or natural rock 80%) AND/OR ures contribute to kitfull and low flow I defined. Stream b bankfull benches, d floodplains along each. Transient s 10-40% of the	or Poor due to lo Erosion may be pre both banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sec temporary/trans instability. Depositio stability, may be	wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute forming/present. ed channels have	widen further. Maj	ority of both banks crosion present on ks. Vegetative to 10-40% of fficient to prevent R 60-80% of the ad by sediment. orary/transient in outing to instability. ad channels have	Deeply incised vertical/lateral in: incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank slc Erosion/raw ban AND/OR Aggrading than 80% of stream	stability. Severe tained within the ad below average ajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%.	
	10% of b	ottom.		bottom.	banks and depositi	ion on > 40% of the ional features which to stability.			deposition, contrib Multiple thread of subterran	uting to instability. channels and/or	
Score	3		2	.4	2	2	1.	6	1		
2. RIPARIA	N BUFFERS: As	ssess both bank	•	n areas along the	•	ugh measuremen	ts of length & widt	th may be accep	table)		
	Optir	mal		ptimal		ginal	Po	or	Downstrea	m sewage	
Riparian Buffers	Tree stratum (dbh > with > 60% tree car non-maintained under located within the	nopy cover and a erstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed	effluent like	_	
			understory.	vegetation).	canopy cover.	stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	and stabilized, or other comparable condition.	lots, trails, or other comparable conditions.			
Condition	1.5	5			High 0.85	inches) present, with <30% tree canopy cover with maintained	and stabilized, or other comparable	other comparable			
Scores  I. Delineate rip descriptors. 2. Determine so pelow.	1.5 parian areas along exquare footage for ea Riparian Area and S % Riparian Area> Score >	ach stream ban	High 1.2 k into Condition C	Low 1.1 ategories and Congth and width.	High 0.85 Indition Scores us	inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	and stabilized, or other comparable condition.  High  0.6	conditions.  Low 0.5  he sums			
Scores  Delineate rip descriptors. Determine so delow. B. Enter the %	arian areas along e quare footage for ea Riparian Area and S % Riparian Area> Score >	ach stream ban ach by measurin Score for each ri 100% 1.5	High 1.2 k into Condition C	Low 1.1 ategories and Congth and width.	High 0.85 Indition Scores us	inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	and stabilized, or other comparable condition.  High  0.6  Ensure tt	Low 0.5 he sums iparian qual 100 100%	CI≕ (Sum % RA * Si		
Scores  Delineate rip descriptors. Determine so delow. Enter the %	quare footage for ea Riparian Area and S % Riparian Area>	ach stream ban ach by measurin Score for each ri 100%	High 1.2 k into Condition C	Low 1.1 ategories and Congth and width.	High 0.85 Indition Scores us	inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	and stabilized, or other comparable condition.  High  0.6  Ensure tt	Low 0.5  he sums iparian qual 100	C⊫ (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2 1.50 1.50	
Scores  Delineate rip descriptors. Descripto	arian areas along e quare footage for ea Riparian Area and S % Riparian Area> Score >	ach stream ban ach by measurin Score for each ri 100% 1.5 100% 1.5 ried substrate si	High 1.2 k into Condition C g or estimating le parian category in	Low 1.1 ategories and Congth and width. (In the blocks below y and depths; wores.	High 0.85 Indition Scores us Calculators are prov.	inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks en	Low 0.5  he sums iparian qual 100 100%	Rt Bank CI >	1.50	
Scores  Delineate rip descriptors. Descripto	arian areas along e quare footage for ea Riparian Area and S % Riparian Area> Score > % Riparian Area> Score >	ach stream ban ach by measurin 100% 1.5 100% 1.5 ried substrate sifte poole comple	High 1.2 k into Condition C g or estimating le parian category in zes, water velocit exes, stable feature	Low 1.1  ategories and Congth and width. Con the blocks below	High 0.85 Indition Scores us Calculators are prov.  ody and leafy deb	inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks en	Low 0.5 he sums iparian qual 100 100%	Rt Bank CI >	1.50	
Scores  Delineate rip descriptors. Descriptors. Determine sy descriptors. Better the % Right Bank  Left Bank  Left Bank  Aundercut banks	arian areas along exquare footage for ease Riparian Area and S % Riparian Area > Score >  % Riparian Area > Score >  M HABITAT: Val ; root mats; SAV; rift	ach stream ban ach by measurin 100% 1.5 100% 1.5 ried substrate si file poole comple	High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo  Stable habitat elei	Low 1.1  ategories and Congth and width. Congth	High  0.85 Indition Scores us Calculators are prov.  Ody and leafy debuil Category  Mary Stable habitat elei	inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr  ginal ments are typically ments are typically	and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks etc.  ate; low embeded.	conditions.  Low 0.5  he sums iparian qual 100 100%  100%  or listed above are	Rt Bank CI >	1.50	
Scores  Delineate rip descriptors. Descriptors. Determine system Descriptors. Descr	arian areas along exquare footage for ea Riparian Area and S % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Var ; root mats; SAV; riff	ach stream ban ach by measurin 100% 1.5 100% 1.5 ried substrate si fle poole comple mal	High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo Stable habitat ele present in 30-509 are adequate fo	Low 1.1 sategories and Congth and width. Congth and width. Congth and depths; wores. Conditional	High  0.85  Indition Scores us Calculators are prov.  Ody and leafy debuil Category  Mary Stable habitat eler present in 10-309 are adequate for	inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substruginal	and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks en alter; low embeded	conditions.  Low 0.5  The sums iparian qual 100 100%  100%  Iness; shade;  Or listed above are stable. Habitat	Rt Bank CI >	1.50	

	St	Stream Impact Assessment Form Page 2							
Project#	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02080106	2/2/2016	05-STR-12		
	pil piles, constrictions, livestock  Conditional Category							NOTES>>	
	Negligible Mi		nor	Moderate		Severe			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed	y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



Typical view of stream looking toward railroad

NC DWQ Stream Identification Form Version 4.11

05-STR-12

Date: 2/2/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.774291
Evaluator: D. Mitchell	County: Hanover County	Longitude: -77.476833
<b>Total Points:</b> 30.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

Absent	Weak	Moderate	Strong
0	1	2	3
0	<u> </u>	2	3
0	1	2	3
0	(1)	2	3
0	$\overline{\Delta}$	2	3
0	(1)	2	3
0	1	2	3
0	(1)	2	3
0	0.5	(1)	1.5
0	0.5		1.5
No	0 = 0	Yes:	= 3
		_	
0	1	(2)	3
0	1	2	3
1.5	1	0.5	0
0	0.5	1	1.5
0	0.5		1.5
No	0 = 0	Yes:	= 3
3	2	(1)	0
3	2	1	0
0	1	2	3
0	1	2	3
0	0.5	1	1.5
0	0.5		1.5
0	0.5		1.5
			1.5
0	0.5		
0		OBL = 1.5 Other = 0	
0 s. See p. 35 of manua nnial stream. Fiel	FACW = 0.75;		
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 0.5 0 0.5 0 0.5 No = 0   0 1 0 0.5 No = 0  3 2 3 2 0 0 1 0 0 5	0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 0 1 2 0 0 1 2 0 0 0.5 1 0 0 0.5 1 No = 0 Yes   3 2 1 No = 0  No = 0   3 3 2 1 0 0 1 2 0 0 1 2 0 0 0.5 1 0 0 0.5 1 0 0 0.5 1 0 0 0.5 1 0 0 0.5 1 0 0 0.5 1 0 0 0.5 1

Sketch: sewage treatement facility

					or use in Virg	nale alaccified as	n wadeable chan	Ear usa i			
	Impact Factor	Impact/SAR length	SAR#	Date	HUC	Cowardin Class.	Locality		Project Name		Project #
				08/31/16	02080106	R2	VA	05	C2RVA - Area	D	N/A
				FD 42	05.07	tion	e and Informa	Stream Name		e(s) of Evalua	
				IR-13	05-S7	Prince de la constante de la c				ering; L. P	
				T	у	Conditional Categor		•		1	Channel C
	ere	Seve	oor	Po	ginal	Marg	ptimal	Subo	timal	Opt	
	tability. Severe	Deeply incised (in vertical/lateral insincision, flow continuous)	unstable. Likely to jority of both banks	Overwidene Vertically/laterally uviden further. Majo	stable than Severe wer bank slopes.	or Poor due to lo	ew areas of active cted banks. Majority table (60-80%).	erosion or unproted	or active erosion: 80-	Van little incision o	Channel
CI	ajority of banks getative protection 120% of banks, is on. Obvious bank Erosion/raw banks /OR Aggrading an 80% of stream by deposition, tability. Multiple d/or subterranean	banks. Streambec rooting depth, ms vertical/undercut. Ve present on less thar not preventing erosis sloughing present. I on 80-100%. AND channel. Greater the bed is covered to contributing to ins thread channels and flow	getative protection % of banks, and is int erosion. AND/OR eam is covered by Sediment is ent in nature, and ability. AND/OR V- s have vegetative int on > 40% of the idiment deposition is	present on 20-40% insufficient to prever 60-80% of the stre sediment. S temporary/transie contributing to insta shaped channels protection is preser	overed by sediment. emporary/transient, ty. Deposition that ability, may be AND/OR V-shaped etative protection on as and depositional	both banks. Vegetat 60% of banks. S bevertical or unde 60% of stream is co Sediment may be t contribute instabilit contribute to st forming/present. A	itative (b0-60%). Iton or natural rock- 80%) AND/OR -80%) AND/OR itures contribute to nkfull and low flow fined. Stream likely inkfull benches, or Ifloodplains along reach. Transient 0-40% of the stream tom.	Vegetative protect prominent (60 Depositional feat stability. The ban channels are well dhas access to banewly developed portions of the sediment covers 10	or active erosion, ob- vegetative surface ral rock, prominent D/OR Stable point nches are present. riginal floodplain or de bankfull benches. and transverse bars addiment deposition n 10% of bottom.	100% stable banks. protection or natur (80-100%). ANI bars/bankfull ber Access to their or fully developed wid Mid-channel bars, few. Transient se	Condition
2.4		1	.6	1.	2	2	.4	2	3	;	Score
		NOTES>>		length & width ma	measurements of	gory	areas along the enditional Cate	Cor	Assess both bank's		RIPARIAN
			Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	grazed pasture,	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	> 3 inches) present, ranopy cover and a aderstory. Wetlands he riparian areas.	with > 60% tree conon-maintained un	Riparian Buffers
			conditions.	comparable condition.	canopy cover with maintained understory.		113022110117	understory.			
			Low	condition.  High	canopy cover with maintained understory.	High	Low	High	<u> </u>	1	Condition
			Low 0.5 the sums Riparian	High 0.6  Ensure the of % R	canopy cover with maintained understory.  Low  0.75	0.85	Low 1.1 egories and Conduth and width. Calc	High 1.2 into Condition Cat or estimating leng	ach by measuring	rian areas along e	Scores  Delineate ripa  Determine squ
			Low 0.5 the sums	High 0.6  Ensure the of % R	canopy cover with maintained understory.  Low  0.75	0.85	Low 1.1 egories and Conduth and width. Calc	High 1.2 into Condition Cat or estimating leng	each stream bank ach by measuring Score for each rips 100%	rian areas along e	Scores  Delineate ripa  Determine squ
	ores*0.01)/2	CI= (Sum % RA * So	Low 0.5 the sums Riparian equal 100 100%	High 0.6  Ensure the of % R	canopy cover with maintained understory.  Low  0.75	0.85	Low 1.1 egories and Conduth and width. Calc	High 1.2 into Condition Cat or estimating leng	each stream bank ach by measuring Score for each ripa	rian areas along e uare footage for ed iparian Area and a % Riparian Area>	Delineate ripa Determine squ Enter the % R
CI	1.20	Rt Bank CI >	Low 0.5 the sums Riparian equal 100 100%	High 0.6  Ensure the of % R	canopy cover with maintained understory.  Low  0.75	0.85	Low 1.1 egories and Conduth and width. Calc	High 1.2 into Condition Cat or estimating leng	each stream bank ach by measuring Score for each rips 100% 1.2	rian areas along e uare footage for e iparian Area and :  % Riparian Area>  Score >	Delineate ripa Determine squ Enter the % R
CI 1.15	,	Rt Bank CI >	Low 0.5 the sums Riparian equal 100 100% 100%	endition.  High  0.6  Ensure the of % R  Blocks ec	canopy cover with maintained understory.  Low 0.75  the descriptors. ed for you below.	0.85	Low 1.1 egories and Cond. th and width. Calc he blocks below. and depths; woody Conditiona	High 1.2  into Condition Cat or estimating leng arian category in the sease, water velocity as features.	each stream bank ach by measuring Score for each rips 100% 1.2 100% 1.1	rian areas along e uare footage for ec iparian Area and s % Riparian Area> Score >  % Riparian Area> Score >  1 HABITAT: Va	Delineate ripa Determine squ Enter the % R Right Bank Left Bank INSTREAN
	1.20	Rt Bank CI >	Low 0.5 the sums riqual 100 100% 100%  s shade; undercut	High  0.6  Ensure tr  of % R  Blocks ec	canopy cover with maintained understory.  Low 0.75  the descriptors. ed for you below.  stable substrate; I	0.85  ition Scores using culators are provided and leafy debris; al Category  Stable habitat eler	Low 1.1 egories and Conduth and width. Calche blocks below.	High 1.2  Into Condition Cat or estimating leng arian category in the season of the se	ach stream bank ach by measuring Score for each rips 100% 1.2 100% 1.1 aried substrate size	rian areas along e uare footage for exiparian Area and s % Riparian Area > Score >  % Riparian Area> Score >  1 HABITAT: Va SAV; riffle poole Opt Habitat elements a	Delineate ripa Determine squ Enter the % R Right Bank Left Bank INSTREAN

Channel Alteration  Channel and a compared pattern or has naturalized.  SCORE  1.5  1.3  1.1  Conditional Category  Negligible  Minor  Moderate  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has not recovered.  SCORE  1.5  1.3  1.1  0.9  0.7  0.5   THE CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  Conditional Category  Moderate  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  SCORE  1.5  1.3  1.1  0.9  0.7  0.5  THE CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  Conditional Category  Moderate  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  SCORE  1.5  1.3  1.1  0.9  0.7  0.5  THE REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  CR = RCI X LF X IF	1.30	1.21
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock    Conditional Category	1.30	1.21
Channel Alteration  Channel and a compared pattern or has naturalized.  SCORE  1.5  1.3  1.1  Conditional Category  Negligible  Minor  Moderate  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has not recovered.  SCORE  1.5  1.3  1.1  0.9  0.7  0.5   THE CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  Conditional Category  Moderate  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  SCORE  1.5  1.3  1.1  0.9  0.7  0.5  THE CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  Conditional Category  Moderate  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  SCORE  1.5  1.3  1.1  0.9  0.7  0.5  THE REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  CR = RCI X LF X IF	1.30	1.21
Negligible   Minor   Moderate   Severe	> 1.21	1.21
Channel Alteration  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  SCORE  1.5  1.3  1.1  0.9  0.7  0.5  Creater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  SCORE  1.5  1.3  1.1  0.9  0.7  0.5  COMPENSATION INDEX (R RCI= (Sum of all CI's)/5  COMPENSATION REQUIREMENT (CRE)	> 1.21	1.21
SCORE  1.5  1.3  1.1  0.9  0.7  0.5  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (R  RCI= (Sum of all CI's)/5  COMPENSATION REQUIREMENT (CR = RCI X LF X IF	> 1.21	1.21
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (R  RCI= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (I  CR = RCI X LF X IF		
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (R  RCI= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (I  CR = RCI X LF X IF		
RCI= (Sum of all Cl's)/5  COMPENSATION REQUIREMENT (  CR = RCI X LF X IF		
CR = RCI X LF X IF	-> 0	0
	_	
INSERT PHOTOS:		
DESCRIBE PROPOSED IMPACT:		

NC DWQ Stream Identification Form Version 4.11

05-STR-13

<b>Date:</b> 08/31/2016	Project/Site: DO	C2RVA - Area 05	Latitude: 37.77	76728
Evaluator: L. Eggering; L. Postaski	County: Hanov	er	Longitude: -77	.475778
<b>Total Points:</b> 34 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		ination (circle on ermitten Perenni		
A Goomorphology (Subtotal 11	Absent	Weak	Moderate	Strong
A. Geomorphology (Subtotal = 11 )  1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool,				
ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	$\overline{1}$	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual			-	
B. Hydrology (Subtotal = $10$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	o = 0	Yes :	= 3
C. Biology (Subtotal = 13 )				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75,	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other met	hods. See p. 35 of manua	al.		
Notes:	-			<u> </u>
01				
Sketch:		2	D <sub>2</sub>	
_		Culvert	<u> </u>	
		(4)		

Wetland

		Stre		SSESS			(For	m 1)			
				wadeable chan							
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	05	VA	R2	02080106	2/2/2016				
Nam	e(s) of Evaluat	or(s)	Stream Nam	e and Informa	ation	05.07					
Channal	D. Mitchell			1			ΓR-14				
. Channel C				C	ondition (erosion, aggradation)  Conditional Category  Marginal Poor						
	Opti	mai	Subo	ptimal	Mar	ginai	Po	or	Sev	ere	
	-	ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN ALLAN AL		ew areas of active	Poor. Banks more	less than Severe or stable than Severe	Overwidene Vertically/laterally u	unstable. Likely to	Deeply incised	(or excavated),	
Channel Condition	Very little incision or 100% stable ban surface protection prominent (80-10 Stable point bars% are present. Acces floodplain or fully bankfull benches. I and transverse ba	iks. Vegetative or natural rock, 00%). AND/OR bankfull benches as to their original developed wide Mid-channel bars,	of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR cures contribute to hkfull and low flow II defined. Stream to bankfull benches, d floodplains along	Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Set temporary/tran instability. Deposition	wer bank slopes. esent on 40-60% of tative protection on Streambanks may yrout. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Majr are near vertical. E 60-80% of banl protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	rosion present on cs. Vegetative and on 20-40% of fficient to prevent composed of the do by sediment. corary/transient in cuting to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious banks lerosion/raw banks and sale.	stability. Severe tained within the ed below average najority of banks tut. Vegetative on less than 20% of eventing erosion. bughing present. liks on 80-100%.	
	sediment deposition 10% of b	covers less than	sediment cover	reach. Transient is 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protection 40% of the band	on is present on > iks and stable		channels and/or	С
Score	3		2	.4	:	2	1.	6	1	I	2.0
NOTES>>	N BUFFERS: A	ssess both bank	s's 100 foot riparia		eld Sheet 1			h may be accep	etable)		
				ditional Cate			_		NOTES>>		
Riparian	Option  Tree stratum (dbh > with > 60% tree ca	3 inches) present, nopy cover and a	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely		Right bank then rail, th ballast.		
Buffers	non-maintained und located within the		containing both herbaceous and shrub layers or a non-maintained understory.	maintained understory. Recent cutover (dense vegetation).	layer (dbh > 3 inches) present, with <30% tree canopy cover.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	crops, active feed lots, trails, or other comparable conditions.			
			High	Low	Hiah	Low	High		]		
Condition		<b>-</b>	_				_	Low			
. Delineate ripe escriptors.	arian areas along e	each stream ban	1.2	1.1	0.85	0.75	0.6	0.5			
Scores  Delineate riprescriptors. Determine scelow.	arian areas along e	each stream ban	1.2 k into Condition C	1.1 Categories and Co	0.85 Indition Scores us	0.75	0.6	0.5 ne sums iparian			
Scores  Delineate ripelescriptors. Determine solelow.	arian areas along e	each stream ban	1.2 k into Condition C	1.1 Categories and Co	0.85 Indition Scores us	0.75	0.6  Ensure the of % R	0.5 ne sums iparian			
Scores  Delineate rip: escriptors. Determine scelow. Enter the % I	arian areas along e quare footage for ea Riparian Area and % Riparian Area>	each stream ban ach by measurin Score for each r 100%	1.2 k into Condition C	1.1 Categories and Co	0.85 Indition Scores us	0.75	0.6  Ensure the of % R	0.5 ne sums iparian qual 100	CI= (Sum % RA * S Rt Bank CI >	cores*0.01)/2	CI
Scores  Delineate ripiescriptors. Determine scielow. Enter the % I	arian areas along e quare footage for ea Riparian Area and 1 % Riparian Area> Score >	each stream ban ach by measurin Score for each r 100% 0.5	1.2 k into Condition C g or estimating le parian category in	1.1 Categories and Co	0.85 Indition Scores us	0.75	0.6  Ensure the of % R	0.5 ne sums iparian qual 100 100%			CI 0.6
Scores  Delineate riprescriptors. Determine scelow. Enter the % I Right Bank  Left Bank	arian areas along e quare footage for e Riparian Area and :  % Riparian Area > Score >  % Riparian Area> Score >  M Riparian Area> Score >	each stream ban ach by measurin Score for each r 100% 0.5 40% 0.85 ried substrate si	1.2 k into Condition C g or estimating le parian category in 60% 0.75 zes, water velocit	1.1 Pategories and Coungth and width. Coungth and w	0.85 Indition Scores us Calculators are prov.	0.75 sing the ovided for you	0.6  Ensure the of % R Blocks ed	0.5 ne sums iparian qual 100 100%	Rt Bank CI >	0.50	
Scores  Delineate ripitescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	arian areas along e quare footage for ex Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Va ; root mats; SAV; riii	each stream ban ach by measurin 100% 0.5 40% 0.85 ried substrate siffle poole comple	tinto Condition C g or estimating le parian category in  60% 0.75  zes, water velocit exes, stable featu	1.1 Sategories and Congth and width. Con the blocks below	0.85 Indition Scores us Calculators are prov.	0.75 sing the ovided for you oris; stable substr	O.6  Ensure the of % R Blocks en	0.5 ne sums iparian qual 100 100% 100%	Rt Bank CI >	0.50	
Scores  Delineate ripidescriptors. Determine scoledw. Enter the % I  Right Bank  Left Bank  Left Bank  Instream  Habitat/  Available	arian areas along e quare footage for ex Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Va ; root mats; SAV; rii  Optii Habitat elements ar	ach stream ban ach by measurin 100% 0.5 40% 0.85 ried substrate si ffle poole comple	tinto Condition C g or estimating le parian category in  60% 0.75  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	1.1 categories and Congth and width. Congth and width. Congth the blocks below by and depths; wo res.  Conditional ments are typically 6 of the reach and	0.85 Indition Scores us Calculators are prov.  ody and leafy detail Category  Mar.  Stable habitat ele present in 10-30%	0.75 sing the ovided for you oris; stable substructions are typically 6 of the reach and	o.6  Ensure the of % R Blocks en	0.5  ne sums iparian qual 100 100%  100%  or listed above are stable. Habitat	Rt Bank CI > Lt Bank CI > NOTES>>	0.50	
Scores  Delineate ripidescriptors. Determine scielow. Enter the % I Right Bank  Left Bank  INSTREAI Indercut banks; Instream Habitat/	arian areas along e quare footage for ex Riparian Area and 9 % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Va ; root mats; SAV; rii	ach stream ban ach by measurin 100% 0.5 40% 0.85 ried substrate si ffle poole comple	1.2  k into Condition C g or estimating le parian category in  60% 0.75  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50% are adequate fo	1.1 sategories and Conngth and width. Connection and width. Connection and width. Connection and width. Connection and width. Connection and width. Connection and width. Connection and width. Connection and width. Connection and width. Connection and width. Connection and width. Connection and wid	0.85 Indition Scores us Calculators are prov.  Ody and leafy det Il Category Mar.  Stable habitat ele present in 10-30° are adequate fo	0.75 sing the ovided for you ovided	0.6  Ensure the of % R Blocks ed  ate; low embeded  Po Habitat elements	0.5 ne sums iparian qual 100 100% 100%  Iness; shade;  or listed above are stable. Habitat	Rt Bank CI > Lt Bank CI > NOTES>>	0.50	

	St	ream In	npact A	ssessm	ent For	m Page	e 2			
Project #	Applicant		Locality	Cowardin Class. HUC		Date Data Point		SAR length	Impact Factor	
N/A	CSX		VA	R2	02080106	2/2/2016	05-STR-14			
	L ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, spoil piles, constrictions, livestock  Conditional Category					zation,	NOTES>> Some char	nnelization		
	Negligible	Mii			erate	Severe				
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	50% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or tent.	occurred in the past.		С
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			0.9
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IIS REACH			
OTE: The CIs and	RCI should be rounded to 2 decimal places.	The CR should be roun	ded to a whole numb	er.			THE REACH	CONDITION IN	DEX (RCI) >>	
							RC	I= (Sum of all C	Cl's)/5	
							COMPENSAT	ION REQUIRE	MENT (CR) >>	0

### INSERT PHOTOS:



Top Right: View of stream away from railroad ballast

Bottom Right: Typical view of stream, tributary to Falling Creek



CR = RCI X LF X IF

Project/Site: DC2RVA - Area 05

NC DWQ Stream Identification Form Version 4.11

Date: 2/2/2016

05-STR-14

Latitude: 37.774291

Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Ephemeral Inter	mitter Perenni	e.g. Quad Name:	
A. Geomorphology (Subtotal = 14)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	$\underline{\underline{}}$	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	<u> </u>	2	3
8. Headcuts	0		2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	= 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 11)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	1) -	1.5
17. Soil-based evidence of high water table?		= 0	Yes:	
C. Biology (Subtotal = 8	L			
18. Fibrous roots in streambed	3	2		0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
	ods. See p. 35 of manual			
*perennial streams may also be identified using other meth Notes: Field Sheet: 13-A-STM-13.	эаэ. Эээ р. ээ эааа.			

Conditional Category    Company   Co		Ephe	mera	I Stre	fied Stream I	Methodology 1	or use in Virg		(Fori	m 1a)	
Name(s) of Evaluator(s)  Discrete Name and Information  D. Mitchell  C. RIPARIAN BUFFERS: Assess both barvis 100 foot riparian areas along the entire SAR. (bough measurements of length & with may be acceptable)  C. Conditional Category  With a below foot with the SAR in the Company of the Conditional Category  With the SAR in the Company of the Conditional Category  With the SAR in the Company of the Conditional Category  With the SAR in the Company of the Conditional Category  With the SAR in the Company of the Condition Category and SAR in the Condition Category and Category an	Project #		Project Nam	е		Cowardin		Date	SAR#		
D. Mitchell  Conditional Calegory  Conditional Calegory  Pour Institute of Conditional Calegory  Ripata Suboptimal Suboptimal (Spite 3 price)  Ripata Suboptimal Suboptimal (Spite 3 price)  Ripata Suboptimal Suboptimal (Spite 3 price)  Ripata Suboptimal Suboptimal Spite stress (Spite 3 price)  Ripata Suboptimal Spite stress (Spite 3 price)  Ripata Suboptimal Spite stress (Spite 3 price)  Ripata Suboptimal Spite stress (Spite 3 price)  Ripata Suboptimal Spite stress (Spite 3 price)  Ripata Suboptimal Spite stress (Spite 3 price)  Ripata Suboptimal Spite stress (Spite 3 price)  Ripata Suboptimal Spite stress (Spite 3 price)  Ripata Suboptimal Spite stress (Spite 3 price)  Ripata Suboptimal Spite stress (Spite 3 price)  Ripata Suboptimal Spite stress (Spite 3 price)  Ripata Suboptimal Spite stress (Spite stress (Spite 3 price)  Ripata Suboptimal Spite stress (Sp	N/A	DO	C2RVA - Area	ı 05	VA		02080106	2/4/2016		iongai	. 40101
Conditional Category  Optimal Suboptimal Law Suboptimal Law Suboptimal Hayman Suboptimal Law Suboptimal Hayman Hayman Suboptimal Hayman Su	Name	. ,	tor(s)	Stream Nam	e and Inform	ation	OF 0-	FD 45			
Conditional Category    Coptinual   Suboptimal   Suboptimal   Signature   Category   Suboptimal   Signature   Category   Suboptimal   Signature   Category   Suboptimal   Signature   Category   Suboptimal   Signature   Category   Suboptimal   Signature   Category   Suboptimal   Signature   Category   Suboptimal   Signature   Suboptimal   Suboptimal   Signature   Suboptimal   Suboptimal   Signature   Suboptimal		ט. Mitchell					U5-S	IK-15			
Committee   Comm	RIPARIAN	N BUFFERS:	Assess both ban	•		,	ugh measuremen	ts of length & wid	th may be accept		
Riparian Buffers  Commission of Section 2 in Challed present in the Section of Section 2 in Challed present		Opt	imal			<del> </del>		Po	oor		rail bed.
Scores 1.5 1.2 1.1 0.85 0.75 0.5 0.5 0.85 Ensure the units estimated percentage of condition Scores using the escorious.  Determine square footage for each try measuring or estimating length and width. Calculations are provided for you ellow.  Eiter the % Ripartian Area and Score for each ripartian catagory in the blocks below.  Right Bank   % Ripartian Area and Score for each ripartian catagory in the blocks below.  Eiter the % Ripartian Area and Score for each ripartian catagory in the blocks below.  Eiter the % Ripartian Area and Score for each ripartian catagory in the blocks below.  Eiter the % Ripartian Area and Score for each ripartian catagory in the blocks below.  Eiter the % Ripartian Area and Score for each ripartian catagory in the blocks below.  Eiter the % Ripartian Area and Score for each ripartian catagory in the blocks below.  Eiter the % Ripartian Area and Score for each ripartian catagory in the blocks below.  Eiter the % Ripartian Area and Score for each ripartian catagory in the blocks below.  Eiter the % Ripartian Area and Score for each ripartian catagory in the blocks below.  Blocks equal 100  Cite (Sum % RA * Scores*0 01)/2  Each Eiter the sums of the Store		Tree stratum (dbh with > 60% tree ca non-maintained un	> 3 inches) present inopy cover and an derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	right bank road then d brush (priv Sheet: 13-	= gravel dense et). Field
1. Delineate program areas along each stream bank into Condition Categories and Condition Scores using the descriptions.   2. Determine squared lootage for each by measuring or estimating length and width. Calculators are provided for you be provided for you be present the program of the provided for you be present of the provided for you be present of the provided for you be provided for you be present of the provided for you be present of the provided for you be provided for you be present of the provided for you be present of the provided for you be present of the provided for you be present of the provided for you be present of the provided for you be present on the provided for you be provided for you be present on the provided for you be provided f		1	.5		1.1		0.75	Ū	0.5		
Circ   Sum % RA* Scores*0.01/2	Delineate ripa     descriptors.     Determine squelow.     Enter the % R	uare footage for e	Score for each 1	ng or estimating le	ength and width.	Calculators are pr	-	of % F	Riparian equal 100		
Score > 0.5 Lt Bank Cl > 0.50  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  NOTE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCl) >>  RCl= (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >>		Score >	0.5	0.85						CI= (Sum % RA * S	cores*0.01)/2
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  IOTE: The Cls and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  NSERT PHOTOS:	Left Bank	· ·							100%		
THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  WSERT PHOTOS:		Score >		CAUDITION	NDEV and 6	TDE AM COL	ADITION UN	ITC FOR TH	IC DEACH	Lt Bank CI >	0.50
RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  NSERT PHOTOS:	OTE: The Cls and R	RCI should be rounded					ADITION ON	liorok iii		CONDITION IND	EX (RCI) >>
CR = RCI X LF X IF  NSERT PHOTOS:									R	CI= (Riparian CI)	/2
NSERT PHOTOS:											ENT (CR) >>
DESCRIBE PROPOSED IMPACT:											
DECORDE I ROI OSED IMITACI.	DESCRIPE P	יי פארטיפיי	ИРАСТ:								
	DESCRIBE P	・ベンアンシミレ 川	WEAUI:								

NC DWQ Stream Identification Form Version 4.11

05-STR-15

Date: 2/4/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.773692
Evaluator: D. Mitchell	County: Hanover County	Longitude: -77.476565
Total Points: 16 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 6)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	9	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	o = 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $\frac{4}{}$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	<b>)</b>	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	<b>(</b> N	o = 0	Yes :	= 3
C. Biology (Subtotal = 6				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3

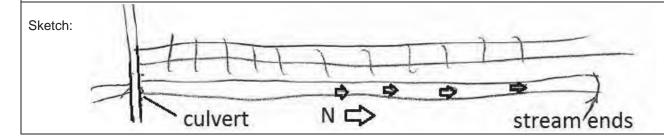
21. Aquatic Mollusks 1 22. Fish 0.5 1.5 0 1 23. Crayfish 0.5 1 1.5 24. Amphibians 0 0.5 1 1.5 25. Algae 0 1.5 0.5

FACW = 0.75; OBL = 1.5 Other = 0

\*perennial streams may also be identified using other methods. See p. 35 of manual.

26. Wetland plants in streambed

Notes: Stream ends at area with lots of debris. Culvert is likely, but unsure of direction. Field Sheet: 13-A-STRM-1.



		Otic	am A	ううせうう fied Stream M			_	· · · · · · ·			
				wadeable chani							
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area		VA	R2	02080106	8/29/2016				
	e(s) of Evaluat	. ,	Stream Nam	e and Informa	ation	05.07	FD 40				
	ering, L. Po		tion of the atroom	and provailing of	andition (aronian	05-S	R-16				
Chamilei C	Olidition. Asse	iss the cross-sec	tion of the stream		ondition (erosion,						
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	rere	
		معرب هملاب	Slightly incircle for	ew areas of active		less than Severe or	Overwidend		Deeply incised	(or excavated).	
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-10 Stable point bars/l are present. Acce floodplain or fully bankfull benches. and transverse ba sediment deposition	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars, irs few. Transient n covers less than	erosion or unproted of banks are sit Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope portions of the r sediment cover	ted banks. Majority lable (60-80%). ition or natural rock (80%) AND/OR ures contribute to this label. Stream of bankfull and low flow II defined. Stream of bankfull benches, of floodplains along each. Transient s 10-40% of the	or Poor due to lo Erosion may be pro both banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sec temporary/trans instability. Depositic stability, may be AND/OR V-shapi	esent on 40-60% of tative protection on Streambanks may wrout. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present. ed channels have	Vertically/laterally widen further. Maj are near vertical. E 60-80% of banih protection presei banks, and is insu erosion. AND/OD stream is covere Sediment is temp nature, and contrit AND/OR V-shape vegetative protecti	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent each by sediment. orary/transient in puting to instability. de channels have on is present on >	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present to banks, is not pre Obvious bank sl. Erosion/raw bar AND/OR Aggradin	stability. Severe tained within the ad below average najority of banks tut. Vegetative on less than 20% of eventing erosion. bughing present. iks on 80-100%. g channel. Greater n bed is covered by	
			stream	bottom.		on on > 40% of the onal features which to stability.	40% of the bar sediment depos		Multiple thread subterran	channels and/or	CI
Score	3	3	2	.4		2	1.	6			2.0
RIPARIAN	I BUFFERS: A		s's 100 foot riparia		e entire SAR. (rou				R-2, rework	area.	
	Opti	mal		ptimal		ginal	Po	or	Hardwood	forest	
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the	nopy cover and a derstory. Wetlands	to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	surrounds channel. C flows unde railway via	this hannel er the	
			High	Low	High	Low	High	Low			
Candition	1.	5	1.2	1.1	0.85	0.75	0.6	0.5			
Condition Scores											
Delineate ripa escriptors. Determine squal	arian areas along e uare footage for e Riparian Area and	ach by measurin Score for each ri	g or estimating le	ngth and width. C	Calculators are pro	-	Ensure the of % R	ne sums iparian qual 100			
Delineate ripa scriptors. Determine squ low. Enter the % R	arian areas along e	ach by measurin	g or estimating le	ngth and width. C	Calculators are pro	-	of % R	ne sums iparian			
Delineate ripa scriptors. Determine squ low. Enter the % R	arian areas along e uare footage for e Riparian Area and % Riparian Area> Score >	ach by measurin Score for each ri 100% 1.2	g or estimating le	ngth and width. C	Calculators are pro	-	of % R	ne sums iparian qual 100 100%	Cl= (Sum % RA * S	,	
Scores  Delineate ripa Scriptors. Determine squ ow. Enter the % R ight Bank	arian areas along e uare footage for e Riparian Area and % Riparian Area> Score >	ach by measurin Score for each ri 100% 1.2	g or estimating le	ngth and width. C	Calculators are pro	-	of % R	ne sums iparian qual 100	Rt Bank CI >	1.20	CI
Delineate ripa scriptors. Determine squ low. Enter the % R Right Bank	arian areas along e uare footage for e Riparian Area and % Riparian Area> Score >	ach by measurin Score for each ri 100% 1.2 100% 1.2 aried substrate si	g or estimating le parian category in	ngth and width. C	calculators are prov.	ovided for you	of % R Blocks e	ne sums iparian qual 100 100%	Rt Bank CI > Lt Bank CI > NOTES>> This inforn	1.20 1.20 nation was	CI 1.20
Delineate ripa scriptors. Determine squilow. Enter the % R Right Bank	arian areas along e uare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  ### HABITAT: Va	Score for each ri 100% 1.2 100% 1.2 aried substrate si	g or estimating le	ngth and width. Con the blocks below	calculators are prov.  v.  ody and leafy deb	ovided for you	of % R Blocks e	iparian qual 100 100% 100%	Rt Bank CI > Lt Bank CI > NOTES>> This inform	1.20 1.20 nation was	
Delineate ripa scriptors. Determine squ low. Enter the % R Right Bank	ware footage for exceptions and ware footage for exceptions and ware footage for exceptions and ware footage for exceptions are supported by Riparian Areas Score >	ach by measurin  Score for each ri  100%  1.2  100%  1.2  aried substrate si ffle poole comple  mal	g or estimating le parian category in  zes, water velocit exes, stable featur  Subor  Stable habitat ele present in 30-509 are adequate fo	y and depths; wo	calculators are prov.  ody and leafy debut Category  Mary  Stable habitat eler present in 10-30% are adequate for are provinced to the control of the contro	ovided for you	of % R Blocks er Blocks er Blocks er Blocks er	ne sums iparian qual 100 100%  100%  ress; shade;  or  listed above are stable. Habitat	Rt Bank CI > Lt Bank CI > NOTES>> This inforn	1.20 1.20 nation was om the , so data is from 13-	

	St	ream In	npact A	ssessm	ent For	m Page	e 2			
Project#	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	csx		VA	R2	02080106	8/29/2016	05-STR-16			
	L ALTERATION: Stream cross	ings, riprap, cond	crete, gabions, or	concrete blocks,	straightening of cl	nannel, channeliz	ation,	NOTES>>		
embankments, s	spoil piles, constrictions, livestock		Conditiona	I Category					nation was	
	Negligible	Mi	nor	Mod	erate	Sev	ere	missing fro field sheet		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	disrupted by any of the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		Greater than 8 disrupted by any alterations listed guidelines AND/C shored with ga cem	of the channel in the parameter PR 80% of banks bion, riprap, or	presented A-STR-13-	is from 13-	C
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5			0.
	REACH CO	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			
OTE: The CIs and F	RCI should be rounded to 2 decimal places. T	The CR should be rour	nded to a whole number	er.				CONDITION IN		
								I= (Sum of all C		
						<u></u>		I X LF X IF	(0,	
									<u> </u>	
DESCRIBE F	PROPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11

05-STR-16

Date: 8/31/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.771883
Evaluator: L. Eggering, L. Postaski	County: Hanover County	Longitude: -77.479651
<b>Total Points:</b> 35 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 14.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	$\overline{\Omega}$	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	0 = 0	Yes	
a artificial ditches are not rated; see discussions in manual				<u>ر</u>
B. Hydrology (Subtotal = 9)		_		
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	
C. Biology (Subtotal = 11.5 )				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	<u>Q</u>	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75,	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other metho	ds. See p. 35 of manua			
Notes: Original Field Sheet: 12-A-STR-2, rework			me stream as 13-A	-STR-13_DM.
		•		
1 1				
Sketch:	VAV	GHAN R.D.		
		diving Co.		
	£	2- culvert		
H		+	_	
$\vdash$				

Conditional Category   Suboptimal   Suboptimal   High Suboptimal	Project # Project Name   Locality   Cowardin   Class   HUC   Date   SAR # Impact SAR   Impact Factor   Factor		Ephe	mera		am As	/lethodology f	or use in Virg		(For	m 1a)	
N/A DC2RVA - Area 05 VA R6 02080106 2/4/2016	Name(s) of Evaluator(s)  D. Mitchell  O. STR-17  2. RIPARIAN BUFERS: Assess both bank's 100 four inparts are areas along the entire SAR. (loculy measurements of length & with may be acceptable)  Conditional Category	Project #		Project Name	)		Cowardin		Date	SAR#		
D. Mitchell  Conditional Category  Optimal Suboptimal High Suboptimal High Suboptimal Was of the entire starts. Unw Marginal with tree stratum (6th > 3 inches) present, with 30% inches) present, with 30% inches) present, with 30% inches) present, with 30% stee and a con-markaned understory. Wellands of understory. Wellands of understory. Wellands area.  Which Education Super or a con-markaned understory. Wellands area.  Which High Low High Low High Low High Low High Low Optionals (area) present, with 30% stee and a con-markaned understory. Wellands area.  Which High Low High Low High Low High Low High Low High Low Deleterate (part of the conception) and shrub layer or a fee along process and a normalisated understory. Wellands area.  Which High Low High Low High Low High Low High Low Deleterate (part of the conception) and shrub layer (at the conception). In the conception of the c	Condition  1.5   1.2   1.1   0.85   0.75   0.6   0.5    Condition   1.5   1.5   1.2   1.1   0.85   0.75   0.6   0.5    Condition   1.5   1.5   1.5   1.5   0.5   0.5	N/A	DC	C2RVA - Area	05	VA		02080106	2/4/2016		g	7 0000
Conditional Category  Optimal Suboptimal High Suboptimal Figure and areas.  Riparian areas along each stream bank into Condition Category.  Conditional Category  Optimal Suboptimal High Suboptimal Figure and areas.  Riparian areas along each stream bank into Condition Categories and Condition Scores using the Determine square lotage for each by measuring or estimating length and width. Calculators are provided for you show that the Score > 0.85 0.5  Right Bank  Riparian Areas 40% 60% Score > 0.85 0.5  Right Bank  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Score > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Score > 1.2  Riparian Areas 1000% Scores > 1.2  Riparian Areas 1000% Sco	Conditional Category  Optimal   Suboptimal	Name		tor(s)	Stream Nam	e and Informa	ation	05.0	FD 47			
Conditional Category   Suboptimal   Suboptimal   High Suboptimal	Optimal Suboptimal Caregory    High Suboptimal Caregory   Marginal   High Suboptimal Caregory   Marginal   High Suboptimal Caregory   High Suboptimal Carego		D. Mitchell					05-8	IK-1 <i>1</i>			
Condition   Scores   1.5   1.2   1.1   0.85   0.75   0.6   0.5	Condition   Figure	. RIPARIAN	BUFFERS:	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	th may be accept	able)	
Riparian Buffers  Riparian areas with 5 05% free canopy cover and an non-maintained understory. Wetlands areas.  High Suboptimals Riparian areas with ree stratum (dbh > 3 inches) present, with 5 05% free canopy cover and an non-maintained understory. Wetlands areas.  High Suboptimals Riparian areas with ree stratum (dbh > 3 inches) present, with 5 05% free canopy cover and an non-maintained understory. Wetlands areas.  High Suboptimals Riparian areas with ree stratum (dbh > 3 inches) present, with 5 05% free canopy cover and an non-maintained understory. Wetlands areas.  High Suboptimals Riparian areas with ree stratum (dbh > 3 inches) present, with 5 05% free canopy cover and an non-maintained understory. Wetlands areas.  High Suboptimals Riparian areas with ree stratum (dbh > 3 inches) present, with 5 05% free canopy cover and an non-maintained understory. Wetlands areas.  High Suboptimals Riparian areas with ree stratum (dbh > 3 inches) present, with 5 05% free canopy cover and an non-maintained understory. Wetlands areas.  High Poor: More and Substitute of the sample of the canopy cover with an on-maintained area, should standare, with 30% free canopy cover with any of the canopy co	High Adoptional Recommendation of the Commendation							_				
Riparian areas with tree stratum (dbh > 3 inches) present, with 50% tree canopy cover and normaintained understory. Welfands areas.    High Suboptimal Riparian areas with tree stratum (dbh > 3 inches) present, with 50% tree canopy cover and normaintained understory. Welfands areas.   High Suboptimal Riparian areas with tree stratum (dbh > 3 inches) present, with 50% tree canopy cover and normaintained understory.   Welfands areas.   Welfands area.   Welfands areas.   Welfands areas.   Welfands area.   Welfands area.   Welfands area.   Welfands area.   Welfands area.   Welfands area.   Welfands area.   Welfands area.   Welfands area.	Rigarian Buffers  Rigarian From details (dish > 1 sinched) process (dish) > 3 devices (di		Opt	ımal	Subo		Mar	Low Marginal:		oor	_	
Riparian Buffers  Tree stratum (dbh > 3 inches) present, with 30%	Riparian Buffers  The distance (201 - 3 inches) present, which is distance in the distance of				Riparian areas	Riparian areas		dense herbaceous	Lawns, mowed, and maintained		_	
## Suffers and Buffers    Non-maintained understory. Wetlands areas.   Wetlands area.   We	buffers on-manufacturing, Williams (carcay) over an area and control of the carcay over an area and control of the carcay over a con		Trop stratum (dbb :	> 3 inches) present	(dbh > 3 inches)	(dbh > 3 inches)	dense herbaceous	riparian areas	no-till cropland;	surfaces, mine	A-STRM-2.	
containing both herbaceous and shrub layers or an shrub layers or an on-maintained understory.  High Low High Low High Low High Low High Low High Low High Low High Low Scores  1.5 1.2 1.1 0.85 0.75 0.6 0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the sacriptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you slow.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank  % Riparian Area 40% 60%  Score > 0.85 0.5   Cla (Sum % RA * Scores*0.01)/2  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank  % Riparian Area 100%  Score > 1.2 1.2 1.1 0.85 0.75  The Cla and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF	areas: leading to the characters and secretary of the characters are secretary of the characte		with > 60% tree ca	nopy cover and an	to 60% tree	cover and a	layer or a tree	production, ponds,	pasture, sparsely	denuded surfaces,		
Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Secretors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you alow.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Enter the % Riparian Area and Score or each inparian category in the blocks below.  Enter the % Riparian Area and Score for each or iparian category in the blocks below.  Enter the % Riparian Area and Score or each or iparian category in the blocks below.  Enter the % Riparian Area and Score for each inparian category in the blocks below.  Enter the % Riparian Area and Score for each inparian category in the blocks below.  Enter the % Riparian Area and Score for each inparian category in the blocks below.  Enter the % Riparian Area and Score for each inparian category in the blocks below.  Enter the % Riparian Area and Score for each inparian category in the blocks below.  Enter the % Riparian Area and Score for each inparian category in the blocks below.  Enter the % Riparian Area and Score for each inparian category in the blocks below.  Enter the % Riparian Area and Score for each inparian category in the blocks below.  Enter the % Riparian Area and Score for each inparian category in the blocks below.  Enter the % Riparian Area and Score for each inparian category in the blocks below.  Enter the % Riparian Area and Score for each inparian category in the blocks below.  Enter the % Riparian Area and Score for each inparian category in the blocks below.  Enter the % Riparian Area and Score for each inparian category in the blocks below.  Enter the % Riparian Area and Score for each inparian category in the blocks below.  Enter the % Riparian Area and Score for each inparian category in the blocks below.  Enter the % Riparian Area and Score for each inparian category in the blocks below.  Enter the % Riparian Area and Score for each inparian category in the blocks below.  En	Contition   High   Low   High   High   Low   High   High   Low   High   High   Low   High   High   Low   High   High   Low   High   High   Low   High   High   Low   High   High   Low   High   High   Low   High   High   Low   High   High   Low   High   High   Low   High   High   Low   High   High   Low   High   High   Low   High   High   Low   High   High   Low   High   High   Low   High   High   High   Low   High   H				containing both herbaceous and	understory.	inches) present,	present, tree	maintained area, recently seeded	feed lots, trails, or other comparable		
Condition Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the secriptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you slow.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Enter the % Riparian Area Ad% 60% Score > 0.85 0.5 Soore > 0.	Condition Score S  1.5  1.2  1.1  1.8  1.5  1.2  1.1  1.8  1.5  1.5  1.2  1.1  1.8  1.5  1.5  1.5  1.6  1.5  1.6  1.5  1.6  1.5  1.6  1.5  1.6  1.5  1.6  1.5  1.6  1.6				non-maintained	(dense		inches) present,	other comparable	conditions.		
Condition Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the secriptors.  Deltheate riparian areas along each stream bank into Condition Categories and Condition Scores using the secriptors.  Deltheate riparian areas along each stream bank into Condition Categories and Condition Scores using the secriptors.  Deltheate riparian areas along each stream bank into Condition Categories and Condition Scores using the secriptors.  Deltheate riparian areas along each stream bank into Condition Categories and Condition Scores using the secriptors.  Deltheate riparian areas along each stream bank into Condition Categories and Condition Scores using the secriptors.  Deltheate riparian areas along each stream bank into Condition Categories and Condition Scores using the secriptors.  Deltheate riparian areas along each stream bank into Condition Categories and Condition Scores using the secriptors.  Deltheate riparian areas along each stream bank into Condition Categories and Condition Scores using the secriptors.  Deltheate riparian areas along each stream bank into Condition Categories and Condition Scores using the sums  Deltheate riparian areas along each stream bank into Condition Categories and Condition Scores using the sums  Deltheate riparian areas along each stream bank into Condition Categories and Condition Scores using the sums  Deltheate riparian areas along each stream bank into Condition Categories and Condition Scores using the sums  Deltheate riparian areas along each stream bank into Condition Categories and Condition Scores using the sums  Deltheate riparian areas along each stream bank into Condition Categories and Condition Scores using the sums  Deltheate riparian areas along each stream bank into Condition Scores using the sums  Deltheate riparian areas along each stream bank into Condition Scores using the sums  Deltheate riparian areas along each stream bank into Condition Scores using the sums  Deltheate ri	Condition 1.5 1.2 1.1 Delineate rigarian areas along each stream bank into Condition Categories and Condition Scores using the exceptions.  Left the W-Rigarian Areas and Score for each riparian category in the blocks below.  Left the Bank    Seguration Areas   40%   60%				understory.			canopy cover with maintained	condition.			
Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the septiopros.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you alow.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100    CI= (Sum % RA * Scores*0.01)/2	Scores I.3 1.2 1.1 (u.5 U.5 U.5 U.5 U.5 U.5 U.5 U.5 U.5 U.5 U				High	Low	High		High	Low		
Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the secriptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you alow.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100    Right Bank   % Riparian Area   40%   60%   10	Delirente tryation areas along each stream bank into Condition Categories and Condition Scores using the scriptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you lot with the your lot with the provided for you		1	.5	1.2	1.1	0.85	0.75	0.6	0.5		
Determine square footage for each by measuring or estimating length and width. Calculators are provided for you low.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100  Blocks equal 100  Cl= (Sum % RA * Scores* 0.01)/2  Cl= (Sum % RA * Scores* 0.01)/2  Rt Bank Cl > 0.64  Lt Bank Cl > 0.64  Lt Bank Cl > 1.20  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  TE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCl) >>  RCl= (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCl X LF X IF	Determine square florage for each by measuring or estimating length and width. Calculators are provided for you or % Riparian Research Repartian Area and Score for each riparian category in the blocks below.    Ingh Bank   % Repartian Area   40%   60%	Delineate ripa	rian areas along	each stream ban	k into Condition C	Categories and Co	ondition Scores us	sing the	Ensure	the sums		
Enter the % Riparian Area and Score for each riparian category in the blocks below.   Blocks equal 100	Enter the % Ripartian Area and Score for each ripartian category in the blocks below.   Blocks equal 100	Determine squ	uare footage for e	each by measurin	g or estimating le	ength and width. (	Calculators are pr	ovided for you	of % F	Riparian		
Cl= (Sum % RA * Scores* 0.01)/2	Coling   Section   Coling   Coling		tiparian Area and	Score for each ri	parian category i	n the blocks below	w.		Blocks e	equal 100		
Cl= (Sum % RA * Scores*0.01)/2   Left Bank   Marian Areas   100%   Rt Bank Cl > 0.64     Score > 1.2   Lt Bank Cl > 1.20	Left Bank    Score > 1.2	Right Bank								100%		
Score > 1.2   Lt Bank Cl > 1.20	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  REACH CONDITION INDEX (RCI) >>  RCI= (Rignarian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  INDEX		ocore >	0.63	0.5						CI= (Sum % RA * S	cores*0.01)/2
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  OTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  ISERT PHOTOS:	Left Bank								100%		
TE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	THE Teach Condition index (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  SERT PHOTOS:		Score >		ONDITION	NDEV and C	TDEAM COL	NDITION UN	ITC FOR TH	IC DEACH	Lt Bank CI >	1.20
RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  ISERT PHOTOS:	TE: The Cls and R	CI should be rounded					NDITION ON	IIS FOR III		CONDITION IND	EX (RCI) >>
CR = RCI X LF X IF	ISERT PHOTOS:  CR = RCI X LF X IF									R	CI= (Riparian CI)	)/2
	SERT PHOTOS:											ENT (CR) >>
	ESCRIBE PROPOSED IMPACT:											

NC DWQ Stream Identification Form Version 4.11

05-STR-17

Date: 2/4/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.771493
Evaluator: D. Mitchell	County: Hanover County	Longitude: -77.477304
Total Points: 15 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral intermittent Perennial	Other e.g. Quad Name:

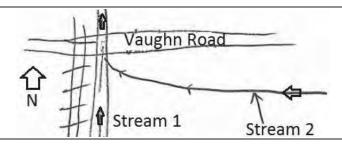
if ≥ 19 or perennial if ≥ 30*			1 3.9. 4.0.0.	
A. Geomorphology (Subtotal = 5.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	<b>6</b>	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	N	0 = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual			•	
B. Hydrology (Subtotal = 3.5				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	= 3
C. Biology (Subtotal = 6			•	
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	2)	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet: 13-A-STRM-2.

26. Wetland plants in streambed

Sketch:



FACW = 0.75; OBL = 1.5 Other = 0

		Stre	Unit	SSESS fied Stream M	lethodology f	or use in Virg	jinia	m 1)		
Project #	Proj	ject Name		Locality	nels classified a Cowardin Class.	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact
N/A	DC2R\	VA - Area	05	VA	R4SB	02080206	2/2/2016		length	Factor
	ne(s) of Evaluator(s			e and Informa						
L. Egg	gering, L. Posta	aski				05-S	ΓR-18			
Channel (	Condition: Assess the	ne cross-sect	tion of the stream							
	Optimal	ı	Subo	ptimal	onditional Categor	ry ginal	Po	or	Sev	/ere
		us.	3			less than Severe or	Overwiden		1	5
Channel Condition	Very little incision or active 100% stable banks. V surface protection or ne prominent (80-100%). Stable point bars/bankf are present. Access to t floodplain or fully devel bankfull benches. Mid-cl and transverse bars few sediment deposition cove	Vegetative latural rock, . AND/OR full benches their original eloped wide channel bars, w. Transient	erosion or unprotect of banks are st Vegetative protect prominent (60-Depositional feat stability. The ban channels are well likely has access to or newly developed portions of the r	ew areas of active cted banks. Majority table (60-80%), tion or natural rock-80%) AND/OR urres contribute to likfull and low flow II defined. Stream to bankfull benches, of floodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositiv stability, may be	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	Vertically/laterally widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/OI stream is coverr Sediment is temp nature, and contril AND/OR V-shape	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ad by sediment. orary/transient in puting to instability, ad channels have	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious bank sle Erosion/raw bank	(or excavated), stability. Severe trained within the below average najority of banks tut. Vegetative on less than 20% of eventing erosion. oughing present. lks on 80-100%. g channel. Greater
	10% of bottom			s 10-40% of the bottom.	vegetative protecti banks and depositi contribute	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depor	ks and stable	deposition, contrib Multiple thread	n bed is covered by buting to instability. channels and/or nean flow.
Score	3		2	.4	:	2	1.	6	1	1
RIPARIA	N BUFFERS: Asses		Con	ditional Cate	gory				NOTES>>	
RIPARIA Riparian Buffers	Optimal  Tree stratum (dbh > 3 inc with > 60% tree canopy non-maintained understor located within the ripar	ches) present,	Conc Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.		gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a href="#">a</a> inches) present maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stablized, or other comparable condition.		NOTES>> Some tree of present on Stream para Center Stree	both banks. allels
Riparian Buffers	Optimal  Tree stratum (dbh > 3 inc with > 60% tree canopy, non-maintained understol located within the ripar	ches) present,	Conc Subop High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Categ ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">30% tree canopy cover.</a> High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Some tree of present on Stream para Center Stree	both banks. allels
Riparian Buffers  Condition Scores  Delineate ripscriptors. Determine solow.	Optimal  Tree stratum (dbh > 3 inc with > 60% tree canopy, non-maintained understoil located within the ripar located wit	ches) present, cover and a prov. Wetlands rian areas.	Conc Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C	ditional Catecy ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Some tree of present on Stream para Center Stree	both banks. allels
Riparian Buffers  Condition Scores  Delineate rip Secriptors. Determine selow. Enter the %	Optimal  Tree stratum (dbh > 3 inc with > 60% tree canopy, non-maintained understoil located within the ripar located wit	ches) present, cover and a bry. Wetlands rian areas.	Conc Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C	ditional Catecy ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Some tree of present on Stream para Center Stree	both banks. allels et.
Riparian Buffers  Condition Scores  Delineate ripscriptors. Determine sellow. Enter the % Right Bank	Tree stratum (dbh > 3 inc with > 60% tree canopy, non-maintained understor located within the ripar  1.5  parian areas along each quare footage for each b Riparian Area and Score % Riparian Area > Score >	ches) present, cover and a prov. Wetlands rian areas.	Conc Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C	ditional Catecy ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Some tree of present on a Stream para Center Stree	both banks. allels et.
Condition Scores  Delineate rip secriptors. Determine s John March	Tree stratum (dbh > 3 inc with > 60% tree canopy, non-maintained understoil located within the ripar  1.5  parian areas along each quare footage for each b Riparian Area and Score % Riparian Area   % Riparian A	stream bank by measuring re for each rig 100% 0.85	Conc Suboj  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating let parian category in	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Some tree corresent on light stream para Center Street  Center Street  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	both banks. allels et.
Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine s slow. Enter the % Right Bank  Left Bank	Tree stratum (dbh > 3 inc with > 60% tree canopy, non-maintained understor located within the ripar  1.5  parian areas along each quare footage for each b Riparian Area and Score % Riparian Area Score >	stream bank by measuring te for each rig 100% 0.85 substrate siz	Conc Suboj  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Cinto Condition C g or estimating len parian category in	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Academic Scores us Calculators are proving the street of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Some tree corresent on light stream para Center Street  Cle (Sum % RA*S Rt Bank CI >	cores*0.01)/2
Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine s slow. Enter the % Right Bank  Left Bank	Tree stratum (dbh > 3 inc with > 60% tree canopy non-maintained understor located within the ripar areas along each equare footage for each to the strategies of the strategie	stream bank by measuring re for each rig 100% 0.85 substrate siz	Conc Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Kinto Condition C g or estimating lee parian category in  parian category in  zes, water velocit ixes, stable featur	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t     of % R     Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Some tree corresent on light stream para Center Street  Center Street  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2
Condition Scores  Delineate rip scriptors. Determine s slow. Enter the % Right Bank  Left Bank  INSTREA	Tree stratum (dbh > 3 inc with > 60% tree canopy, non-maintained understor located within the ripar  1.5  Darian areas along each square footage for each b Riparian Area and Score % Riparian Area Score >  % Riparian Area \$ Score >  M HABITAT: Varied is croot mats; SAV; riffle pi	stream bank by measuring te for each ri 100% 0.85 substrate sizeoole comple	Conc Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Kinto Condition C g or estimating let parian category in  zes, water velocit ixxes, stable featur  Subop  Stable habitat eler	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the condition of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Some tree corresent on light stream para Center Street  Center Street  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2
Riparian Buffers  Condition Scores  Delineate rip secriptors. Determine selow. Enter the % Right Bank  Left Bank  INSTREA adercut banks  Instream Habitat/	Tree stratum (dbh > 3 inc with > 60% tree canopy non-maintained understor located within the ripar areas along each equare footage for each to the strategies of the strategie	stream bank by measuring re for each rig 100% 0.85 substrate siz 200le comple	Conc Suboj  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating let parian category in  parian category in  Suboj  Stable habitat eler present in 30-50% are adequate for are adequat	ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. Co n the blocks belov  ty and depths; wores.  Conditiona pptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/">https://doi.org/10.100/j.nc/</a> High  0.85  Indition Scores us Calculators are proved and leafy determined by and leafy de	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	NOTES>> Some tree copresent on I Stream para Center Stree  Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl> NOTES>>	cores*0.01)/2

Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB	02080206	2/2/2016	05-STR-18		
	L ALTERATION: Stream cross	sings, riprap, conc	rete, gabions, or	concrete blocks, s	straightening of cl	nannel, channeliz	ation,	NOTES>>	
,			Conditiona	I Category				Flows throu	•
	Negligible	Mir	nor	Mode	erate	Sev	rere	under Ashc	аке коаа.
Channel Alteration	or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/C shored with ga cem	y of the channel in the parameter DR 80% of banks bion, riprap, or ient.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH C	ONDITION II	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH		
TE: The CIs and F	RCI should be rounded to 2 decimal places. T	The CR should be roun	ided to a whole number	er.			THE REACH	CONDITION INI	DEX (RCI) >>
							RC	I= (Sum of all C	l's)/5
							COMPENSAT	ION REQUIREN	MENT (CR) >>
							CD DC	XLFXIF	

#### INSERT PHOTOS:



Top Left: View of culvert carrying stream under Ashcake Road Bottom Right: Typical view of stream



Project/Site: DC2RVA - Area 05

NC DWQ Stream Identification Form Version 4.11

Date: 08/31/2016

05-STR-18

Latitude: 37.746807

Evaluator: L. Eggering, L. Postaski	County: Hanov	er County	Longitude: -77	7.485543
<b>Total Points:</b> 20.5 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name	:
A. Geomorphology (Subtotal = 10.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0		2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 5)				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes	= 3
C. Biology (Subtotal = 5				
18. Fibrous roots in streambed	3	2	<u>(1)</u>	0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75; OB	_ = 1.5 Other = 0	
*perennial streams may also be identified using other meth	nods. See p. 35 of manua	al.		
Notes: GIS Stream 13-A-STR-2. Original Field S	Sheet: 13-A-STR-03	3 (rework).		
Sketch:				

	Ur				n Assessment Form (Form 1) Unified Stream Methodology for use in Virginia For use in wadeable channels classified as intermittent or perennial						
Project #		Project Name		wadeable chan	Cowardin	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact	
N/A		2RVA - Area		VA	Class. R2SB	02080206	2/3/2016	OAK#	length	Factor	
	e(s) of Evaluat			e and Informa		02000200	2/3/2010				
J. B	udnik, K. Ast	troth			05-	STR-19	(Stony R	lun)			
. Channel C	Condition: Asse	ess the cross-sec	tion of the stream		ondition (erosion,						
	Opti	imal	Subo	ptimal	Marginal Poor				Sev	ere	
	"	Who have	The state of the s			ess than Severe or	Overwidene		1	5	
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60-Depositional feat stability. The bar channels are wellikely has access to or newly develope portions of the r	ew areas of active table (60-80%). tion or natural rock -80%) AND/OR urres contribute to kifull and low flow Il defined. Stream o bankfull benches, d floodplains along each. Transient	or Poor due to lo Erosion may be pri both banks. Vegei 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositio stability, may be	stable than Severe wer bank slopes. seent on 40-60% of ative protection on Streambanks may rout. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maji are near vertical. E 60-80% of banl protection presei banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrit AND/OR V-shape	ority of both banks rosion present on cs. Vegetative to no 20-40% of fficient to prevent a 60-80% of the dby sediment. orary/transient in justing to instability.	Deeply incised vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/lunderc protection present c banks, is not pre Obvious bank sit. Erosion/raw ban AND/OR Aggrading	stability. Severe tained within the ed below average hajority of banks ut. Vegetative on less than 20% of venting erosion. Dughing present. ks on 80-100%.	
	10% of			s 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protecti 40% of the bar sediment depos	iks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	uting to instability. channels and/or	CI
Score	3	3	2	.4	:	2	1.	6	1	1	2.0
. RIPARIAN	N BUFFERS: A		Con	an areas along the ditional Cate ptimal	gory	ugh measuremen ginal	ts of length & widt		NOTES>> Very narro	w riparian	
			High Suboptimal:	Low Suboptimal:		Low Marginal:			very mane		
Riparian Buffers		anopy cover and a derstory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a href="#">20%</a> tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor:	buffer due on right an developme	to railroad d	
Buffers	with > 60% tree ca non-maintained und	anopy cover and a derstory. Wetlands	with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	on right an	to railroad d	
	with > 60% tree ca non-maintained und	anopy cover and a derstory. Wetlands e riparian areas.	with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	Non-maintained, dense herbacous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, deded surfaces, row crops, active feed lots, trails, or other comparable conditions.	on right an	to railroad d	
Condition Scores  Delineate ripz escriptors. Determine so elow.	with > 60% tree ca non-maintained und located within the	anopy cover and a derstory. Wetlands er iparian areas.  5 each stream ban each by measuring the cover and the cove	with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C	with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. (congth)	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processors of the condition of the con	dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a documents-super-s<="" href="documents-super-s&lt;/td&gt;&lt;td&gt;Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.&lt;/td&gt;&lt;td&gt;Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5&lt;/td&gt;&lt;td&gt;on right an&lt;/td&gt;&lt;td&gt;to railroad&lt;br&gt;d&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;/tr&gt;&lt;tr&gt;&lt;td&gt;Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % F&lt;/td&gt;&lt;td&gt;with &gt; 60% free co&lt;br&gt;non-maintained und&lt;br&gt;located within the&lt;br&gt;located within the&lt;br&gt;arian areas along of&lt;br&gt;uuare footage for e&lt;br&gt;Riparian Area and&lt;br&gt;% Riparian Area&gt;&lt;/td&gt;&lt;td&gt;anopy cover and a derstory. Wetlands er iparian areas.  5 each stream ban each by measurin Score for each r 10%&lt;/td&gt;&lt;td&gt;with tree stratum (dbh &gt; 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating leparian category in 10%&lt;/td&gt;&lt;td&gt;with tree stratum (dbh &gt; 3 inches) present, with &gt; 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  categories and Co ngth and width. ( n the blocks below 80%&lt;/td&gt;&lt;td&gt;Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh &gt; 3 inches) present, with &lt;30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processors of the condition of the con&lt;/td&gt;&lt;td&gt;dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh &gt;3 inches) present, with &lt;a href=" td=""><td>Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R</td><td>Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5</td><td>on right an</td><td>to railroad d</td><td></td></a>	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	on right an	to railroad d	
Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % F	with > 60% free co non-maintained und located within the located within the 1. arian areas along of quare footage for e	anopy cover and a derstory. Wetlands er riparian areas.  5 each stream ban each by measurin	with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating leeparian category in	with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  categories and Co	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processors of the condition of the con	dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a documents-super-s<="" href="documents-super-s&lt;/td&gt;&lt;td&gt;Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R&lt;/td&gt;&lt;td&gt;Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5&lt;/td&gt;&lt;td&gt;on right an&lt;/td&gt;&lt;td&gt;to railroad&lt;br&gt;d&lt;br&gt;ent on left.&lt;/td&gt;&lt;td&gt;&lt;/td&gt;&lt;/tr&gt;&lt;tr&gt;&lt;td&gt;Condition Scores  Delineate rips escriptors. Determine scelow. Enter the % F&lt;/td&gt;&lt;td&gt;with &gt; 60% tree oc non-maintained und located within the located withi&lt;/td&gt;&lt;td&gt;anopy cover and a derstory. Wetlands er ipparian areas.  5 each stream ban each by measurin Score for each r 10% 0.85&lt;/td&gt;&lt;td&gt;with tree stratum (dbh &gt; 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.75&lt;/td&gt;&lt;td&gt;with tree stratum (dbh &gt; 3 inches) present, with &gt; 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Congth and width. (and the blocks below 0.5&lt;/td&gt;&lt;td&gt;Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh &gt; 3 inches) present, with &lt;30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processors of the condition of the con&lt;/td&gt;&lt;td&gt;dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh &gt;3 inches) present, with &lt;a href=" td=""><td>Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R</td><td>Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5</td><td>on right an developme CI= (Sum % RA * Si Rt Bank CI &gt;</td><td>to railroad dent on left.</td><td>CI</td></a>	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	on right an developme CI= (Sum % RA * Si Rt Bank CI >	to railroad dent on left.	CI
Condition Scores  Delineate rips escriptors. Determine so elew. Enter the % f	with > 60% tree oc onon-maintained und located within the located with	anopy cover and a derstory. Wetlands er ipparian areas.  5  each stream ban each by measurin Score for each r 10% 0.85	with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in 10% 0.75	with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Lategories and Congth and width. (and the blocks below 80% 0.5	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> . High 0.85 calculators are proved.	dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Loging the povided for you	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to descript the seeded and stabilized area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Les sums imparian qual 100 100%	on right an developme	to railroad d ent on left.	CI 0.56
Condition Scores  Delineate ripe sescriptors. Determine scelow. Enter the % f Right Bank  Left Bank  INSTREAL	with > 60% tree oc conon-maintained und located within the located wit	5 each stream ban sach by measurin Score for each r 10% 0.85 10% 0.85 aried substrate si	with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.75  10% 0.75  zes, water velocit	with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 0.5  80%  0.5	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Acalculators are provided the condition of the condition	dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Loging the povided for you	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to descript the seeded and stabilized area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Les sums imparian qual 100 100%	on right an developme Cl= (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	to railroad dent on left.	
Condition Scores  Delineate ripe escriptors. Determine so elow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream	with > 60% free co non-maintained und located within the located withi	anopy cover and a derstory. Wetlands er ipparian areas.  5.5 each stream ban each by measurin Score for each r 10% 0.85  10% 0.85 aried substrate si iffte poole comple	with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in 10% 0.75  10% 0.75  zes, water velocit exes, stable feature of the stratum of t	with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Coungth and width. (an the blocks below 0.5  80% 0.5  y and depths; wores.  Conditionaptimal	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of the condition	dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  ing the povided for you  pris; stable substrational control of the control o	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  100%  100%	on right an developme Cl= (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	to railroad dent on left.	
Condition Scores  Delineate ripiescriptors. Determine scores  Enter the % if Right Bank  Left Bank  Left Bank  Instream Habitat/ Available	with > 60% tree oc conon-maintained und located within the located wit	anopy cover and a derstory. Wetlands derstory. Wetlands er iparian areas.  5  each stream ban each by measurin Score for each r 10% 0.85  10% 0.85  aried substrate si iffte poole comple imal re typically present	with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in 10% 0.75  2es, water velocit exes, stable feature Subo Stable habitat ele present in 30-50%	with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and County and width. (and the blocks below 0.5  80%  0.5  y and depths; wores.  Conditiona	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the condition of the condi	dense herbaceous vegetation, riparian areas lacking shrub and tree stratum and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with					

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor N/A CSX R2SB 02080206 2/3/2016 05-STR-19 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Culvert and rip-rap near Ashcake Road. Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed i srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. CI 0.5 SCORE 1.5 1.3 1.1 0.9 0.7 0.90

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View of 4 foot concrete culvert to stream
Top Center: View of 6 foot concrete Culvert 08 to railroad
Top Right: View of stream along railroad in galine ROW
Bottom Left: View of stream looking toward railroad bridge
Bottom Right: View of stream from railroad bridge

**Stony Run** 05-STR-19 NC DWQ Stream Identification Form Version 4.11 Project/Site: DC2RVA - Area 05 Date: 2/2/2016 Latitude: 37,746433 Evaluator: J. Budnik, K. Astroth County: Hanover County Longitude: -77.485152 Total Points: 33.5 Stream Determination (circle one) Other Stream is at least intermittent Ephemeral Intermitter Perennial e.g. Quad Name: if ≥ 19 or perennial if ≥ 30\* **Absent** Weak **Moderate** Strong A. Geomorphology (Subtotal = 13.51<sup>a.</sup> Continuity of channel bed and bank 0 2 3 2. Sinuosity of channel along thalweg 0 1 2 3 3. In-channel structure: ex. riffle-pool, step-pool, 0 2 3 1 ripple-pool sequence 2 4. Particle size of stream substrate 3 0 1 1 5. Active/relict floodplain 3 0 6. Depositional bars or benches 0 3 2 7. Recent alluvial deposits 0 3 8. Headcuts 0 3 1 1 9. Grade control 0 0.5 1.5 10. Natural valley 0 0.5 1.5 11. Second or greater order channel No = 0Yes = 3artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 7.53 12. Presence of Baseflow 0 1 (2) 13. Iron oxidizing bacteria 0 1 3 14. Leaf litter 1.5  $\bigcirc$ 0.5 0 15. Sediment on plants or debris 0 0.5 1 1.5 16. Organic debris lines or piles 0.5 0 1.5 17. Soil-based evidence of high water table? No = 0Yes = 3C. Biology (Subtotal = 12.5 2 18. Fibrous roots in streambed 0 19. Rooted upland plants in streambed 3 0 1 2 20. Macrobenthos (note diversity and abundance) 1 2 3 0 3 21. Aquatic Mollusks 1 22. Fish 0.5 1.5 23. Crayfish 0 0.5 1.5 24. Amphibians 0 0.5 1.5 25. Algae 0.5 1.5 FACW = 0.75; OBL = 1.5 Other = 0 26. Wetland plants in streambed \*perennial streams may also be identified using other methods. See p. 35 of manual. Notes: Stony Run. Field Sheet 13-B-STR-05. Ashcake Road Sketch: Culvert ballast

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia Cowardin **Project Name** Project # Locality HUC Date SAR# Class. length DC2RVA - Area 05 02080206 2/2/2016 VA Stream Name and Information Name(s) of Evaluator(s) 05-STR-20 J. Budnik, K. Astroth 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) NOTES>> **Conditional Category** Optimal Marginal Channel runs parallel to railroad. Low Marginal: Non-maintained High Poor: Field Sheet 13-Bligh Suboptima Riparian areas High Marginal ense herbace and maintained Low Poor: with tree stratum (dbh > 3 inches Non-maintained, egetation, riparia STR-06. Impervious surfaces, mine spoil lands, enuded surface with tree stratum areas, nurseries ense herbaceo areas lacking no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, (dbh > 3 inches) Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and arnon-maintained understory. Wetlands present, with 30% tree canop vegetation with shrub and tree present, with 30% to 60% tree canopy cover and Riparian either a shrub stratum, hay roduction, ponds open water. If present, tree Buffers cover and a maintained layer or a tree layer (dbh > 3 row crops, active eed lots, trails, or canopy cover and containing both herbaceous and shrub layers or a understory inches) present with <30% tree recently seeded and stabilized, or other comparable conditions. Recent cutove (dense stratum (dbh >3 canopy cover. inches) present with <30% tree non-maintained understory. ther comparable condition. vegetation). nopy cover w maintained understory. High Low High Low High Low Condition 1.5 0.85 0.75 0.5 1.2 1.1 0.6 Scores areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums escriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below 5% 5% 100% 90% Right Bank 0.85 0.75 0.5 Cl= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> 30% 20% 50% 100% Rt Bank CI > 0.53 CI Left Bank 0.85 0.75 Lt Bank CI > 0.96 0.74 1.1

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

IOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> 0.37

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View upstream
Top Right: Typical view of stream along railroad

Bottom Left: Typical view of stream along railroad Bottom Right: Typical view of stream along railroad

NC DWQ Stream Identification Form Version 4.11

05-STR-20

Date: 2/2/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.738817
Evaluator: J. Budnik, K. Astroth	County: Hanover County	Longitude: -77.487338
Total Points: 16 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorp	phology (Subtotal = 6.5	Absent	Weak	Moderate	Strong
	of channel bed and bank	0	1	(2)	3
2. Sinuosity of	channel along thalweg	0	(1)	2	3
	structure: ex. riffle-pool, step-poo	l, O	1	2	3
ripple-pool s			· ·		_
	e of stream substrate	0		2	3
5. Active/relict			1	2	3
	l bars or benches	(0)	1	2	3
7. Recent alluv	vial deposits	Ō		2	3
8. Headcuts		0	1	2	3
<ol><li>Grade contr</li></ol>	ol	0	0.5	1	1.5
10. Natural val	lley	0	0.5	1	1.5
	greater order channel		No = 0	Yes	= 3
<sup>a</sup> artificial ditches	s are not rated; see discussions in m	anual			
B. Hydrolog	y (Subtotal = <u>4.5</u> )				
12. Presence		0	1	(2)	3
13. Iron oxidizi	ing bacteria	0	1	(2)	3
14. Leaf litter	3	1.5	1	0.5	0
	on plants or debris	0	0.5	1	1.5
	ebris lines or piles		0.5	1	1.5
	evidence of high water table?		No = 0	Yes	
C. Biology	(Subtotal = 5)			1	
18. Fibrous roo	ots in streambed	3	(2)	1	0
19. Rooted up	land plants in streambed	3	2	(1)	0
-	thos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mo	• • • • • • • • • • • • • • • • • • • •	0	1	2	3
 22. Fish			0.5	1	1.5
23. Crayfish		0	0.5	1	1.5
24. Amphibian	IS	0	0.5	1	1.5
25. Algae			0.5	1	1.5
	lants in streambed			OBL = 1.5 Other =	
	ams may also be identified using other	er methods. See p. 35 of man		022	
	ary to Stony Run. Lots of leaf			snow melt. Field S	Sheet
	STR-06.	. ,	<u>,</u>		
.02					_
Sketch:			FLOW		
	52	_=>_	FLOW		
~					
	balla	st		A-4.	
-	7			The san facilities because the sandy	-
-					-

		Stre	Unit	fied Stream M	sessment Form (Form 1)  I Stream Methodology for use in Virginia deable channels classified as intermittent or perennial						
Project #		Project Name		Locality	cowardin Class.	s intermittent or			Impact/SAR Impact Impact Factor		
N/A	DC	C2RVA - Area	05	VA	R2SB	02080206	2/2/2016		lengin	racioi	
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
J. B	udnik, K. As	troth			05-	-STR-21	(Stony F	lun)			
1. Channel (	Condition: Asse	ess the cross-sec	tion of the stream		ondition (erosion, aggradation) conditional Category						
	Opt	imal	Subo	ptimal		ginal	Po	or	Sev	ere	
	1	WA SHARE		~		less than Severe or	Overwiden		1	5	
Channel Condition	very little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.		erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow Il defined. Stream o bankfull benches, d floodplains along	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may errut. AND/OR 40- n is covered by diment may be sisent, contribute on that contribute to forming/present.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu- erosion. AND/OI stream is cover Sediment is temp nature, and contril	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sl Erosion/raw ban	stability. Severe tained within the do below average ajority of banks ut. Vegetative in less than 20% of venting erosion. bughing present. ks on 80-100%.	
	and transverse bars few. Transient sediment deposition covers less than 10% of bottom.  or newly developed f portions of the rea sediment covers stream bottom.		rs 10-40% of the	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.		AND/OR Aggrading channel Greater		С	
Score	3	3	2	.4		2	1.	6	1		2.4
2. RIPARIAI		Assess both bank	Con	an areas along the ditional Cate ptimal		ugh measuremen	ts of length & wid		table)		
Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con	ditional Cate	gory						
Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cr. non-maintained un	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 15%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and County ngth and width. ( In the blocks below 30%	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate rip descriptors. Deltermine scores  Enter the %	Tree stratum (dbh: with > 60% tree conon-maintained un located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both abrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100		cores*0.01)/2	
Condition Scores  Delineate rip elsecriptors. Delermine scoelow. Enter the %	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  10%  0.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 15% 0.75	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	0.91	CI
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine su below. 3. Enter the % Right Bank	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a destrory. Wellands e riparian areas.  5  each stream ban each by measurin  Score for each ri  10%  0.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating leeparian category in 15% 0.75	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. ( n the blocks below 30% 0.85	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si		<u>CI</u>
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREA	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 10% 0.5  10% 0.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 15% 0.75  15% 0.75  zes, water velocit	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 0.85  40% 0.85  by and depths; wores.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.91	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAl undercut banks Instream	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 10% 0.5  10% 0.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 15% 0.75  15% 0.75  zes, water velocit exes, stable feature	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 0.85  40% 0.85  by and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided in the state of the state	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.91	
Condition Scores  1. Delineate rip descriptors. 2. Determine st below. 3. Enter the % Right Bank  Left Bank  3. INSTREA undercut banks Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree conon-maintained un located within th  1.  arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> root mats; SAV; r  Opti Habitat elements a	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  10%  0.5  10%  0.5  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 15% 0.75  15% 0.75  zes, water velocit exes, stable featur  Subo  Stable habitat elpresent in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 30% 0.85  40% 0.85  ty and depths; wores.  Conditional ments are typically & of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the condition of the canopy cover.  45%  1.1  35%  1.1  Stable habitat ele present in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically & of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % Reserved Blocks estable Blocks	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.91	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREA undercut banks Instream Habitat/	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi. root mats; SAV; r  Opti Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  10%  0.5  10%  0.5  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Kinto Condition C g or estimating le parian category in 15% 0.75  15% 0.75  zes, water velocit exes, stable featur  Subop Stable habitat ele present in 30-509 are adequate fo popul	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 30% 0.85  ty and depths; wo res.  Conditional ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.91	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor N/A CSX R2SB 02080206 2/2/2016 05-STR-21 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Culverts. Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. CI SCORE 1.5 1.3 1.1 0.9 0.7 0.5 1.10

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View upstream at Culvert 09 (concrete 5 feet) under railroad Top Right: View upstream at Culvert 09 under railroad Bottom Left: View downstream, away from railroad Bottom Right: View downstream, away from railroad, in gasline ROW

NC DWQ Stream Identification For	rm Version 4.11	Stony Ru	n <b>05</b> -	STR-21
Date: 2/2/2016	Project/Site: DC	2RVA - Area 05	Latitude: 37.73	38280
Evaluator: J. Budnik, K. Astroth	County: Hanove	er County	Longitude: -77	.487437
<b>Total Points:</b> 34.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 15	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	<u>2</u>	3
7. Recent alluvial deposits	0	1	<u> </u>	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = <u>8</u>				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	( No	0 = 0	Yes:	= 3
C. Biology (Subtotal = $11.25$ )				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	$\mathcal{Q}$	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		ACW = 0.75 OBI	_ = 1.5 Other = 0	)
*perennial streams may also be identified using other meth	· ·			
Notes: Stony Run. Heavy flow due to recent sno	ow melt. Field Sheet	13-B-STR-07.		
Culvert C	log creating small	rapid/wash out		

		Stre					ı (For	m 1)			
				fied Stream N wadeable chan							
Project #		Project Name		Locality	Cowardin	HUC	Date	SAR#	Impact/SAR	Impact	
-		-		Locality	Class.	пос	Date	SAR#	length	Factor	
N/A		2RVA - Area		VA	R4SB	02080206	2/2/2016				
	e(s) of Evaluat	` '	Stream Nam	e and Informa	ation	05.03	FD 00				
	udnik, K. Ast						ΓR-22				
. Channel C	Condition: Asse	ss the cross-sec	tion of the stream		ondition (erosion, onditional Categor						
	Opti	mal	Subo	ptimal		ginal	Po	or	Sev	ere	
		مويد هملاب			Often incised, but I	less than Severe or	Overwiden	ed/incised.	1	5	
Channel Condition	Very little incision of 100% stable bar surface protection prominent (80-1) Stable point bars/l are present. Acce floodplain or fully bankfull benches.	nks. Vegetative n or natural rock, 20%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars,	erosion or unprote of banks are s Vegetative protec prominent (60 Depositional feal stability. The bar channels are we likely has access t	ew areas of active cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along	or Poor due to lo Erosion may be pri both banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Set temporary/tran instability. Depositi	stable than Severe wer bank slopes. esent on 40-60% of lative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to that contribute to the sient is severed.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/Of stream is covere Sediment is temp nature, and contril	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre	stability. Severe nained within the ad below average najority of banks tut. Vegetative on less than 20% of eventing erosion. pughing present.	
	and transverse ba sediment depositio 10% of I	n covers less than	portions of the sediment cover	reach. Transient is 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the onal features which to stability.	AND/OR V-shape vegetative protecti 40% of the bar sediment depos	on is present on > aks and stable	AND/OR Aggradin than 80% of stream deposition, contrib	g channel. Greater n bed is covered by outing to instability. channels and/or	CI
Score	3		2	.4	:	2	1.	6	1	I	2.0
NOTES>>	N BUFFERS: A	ssess both bank	s's 100 foot riparia		e entire SAR. (ro			h may be accep	rtable)		
	Opti	mal		ditional Cate		ginal	Po	or	NOTES>>	014/ 1.6	
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	· 3 inches) present, nopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Imperious surfaces, mine	Railroad R bank. Lawi narrow line shrub/scru right bank. Wetland 12	n with e of b along Flow into	
			High	Low	High	Low	High	Low			
Condition Scores	1.	5	1.2	1.1	0.85	0.75	0.6	0.5			
000163	arian areas along e			•	Calculators are pr	-	Ensure to	iparian			
lescriptors. 2. Determine so pelow.	quare footage for e	Score for each r		n the blocks below	v.						
escriptors.  Determine so elow.	Riparian Area and % Riparian Area>	Score for each r	20%	n the blocks belov	v.			100%			
escriptors. Determine so elow. Enter the % F	Riparian Area and	Score for each r		n the blocks below	v.			100%	CI= (Sum % RA * S	cores*0.01)/2	
escriptors. Determine so elow. Enter the % F	Riparian Area and % Riparian Area>	Score for each r 80% 0.75	20%	n the blocks below	V			100%	Rt Bank CI >	0.77	CI
escriptors. Determine so elow. Enter the % I Right Bank  Left Bank	Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >	80% 0.75 100% 0.5	20% 0.85					100%	Rt Bank CI >	,	CI 0.64
lescriptors. Determine scielow. Enter the % f Right Bank  Left Bank  INSTREA	Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Va	80% 0.75 100% 0.5 arried substrate si	20% 0.85	y and depths; wo		oris; stable substr	ate; low embeded	100%	Rt Bank CI >	0.77	
lescriptors.  Determine sc. Determine sc. Determine sc. Lenter the % f. Right Bank  Left Bank  INSTREAL	Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >	80% 0.75 100% 0.5 arried substrate si	20% 0.85	y and depths; wo	ody and leafy det	oris; stable substr	ate; low embeded	100%	Rt Bank CI >	0.77	
lescriptors. Determine so- lescriptors. Determine so- lescriptors. Right Bank  Left Bank  B. INSTREAI undercut banks; Instream	Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Va	Score for each r 80% 0.75 100% 0.5 aried substrate si	20% 0.85 zes, water velociexes, stable featu	y and depths; wo res. Conditiona ptimal	ody and leafy det	ginal	Po	100% ness; shade;	Rt Bank CI >	0.77	
lescriptors.  Determine so less with the solution of the solut	Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Varoot mats; SAV: ri Opti Habitat elements ai	Score for each r 80% 0.75  100% 0.5  arried substrate si ffle poole comple mal	20% 0.85  zes, water velocites, stable features Subortin 30-50%	y and depths; wo res.  Conditiona ptimal ments are typically 6 of the reach and	ody and leafy det  I Category  Mar-  Stable hat bit 10-90 present in 10-30	ginal ments are typically 6 of the reach and	Po Habitat elements lacking or are ur	100% ness; shade; or listed above are stable. Habitat	Rt Bank CI > Lt Bank CI >	0.77	
lescriptors. Determine so lescriptors. Determine so lescriptors. Right Bank  Left Bank  Left Bank  INSTREAL  Indercut banks; Instream  Habitat/	Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Varoot mats; SAV; ri	Score for each r 80% 0.75  100% 0.5  arried substrate si ffle poole comple mal	20% 0.85  zes, water velociexes, stable featu  Subo Stable habitat elegresent in 30-50 are adequate fo	ty and depths; wo res.  Conditiona petimal ments are typically	ody and leafy deball Category  Mary Stable habitat ele present in 10-30% are adequate fo	ginal ments are typically	Po Habitat elements	100% ness; shade; or listed above are stable. Habitat ally present in less	Rt Bank CI > Lt Bank CI >	0.77	

	Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	csx		VA	R4SB	02080206	2/2/2016	05-STR-22			
	HANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, hkments, spoil piles, constrictions, livestock  Conditional Category									
	Negligible	Mir	nor	Mod	erate	Sev	/ere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	in the parameter DR 80% of banks bion, riprap, or			
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5	]		

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View upstream away from railroad
Top Center: Buried culvert and typical view of stream along railroad
Top Right: View of 18 inch brick Culvert 10 feeding stream from under railroad
Bottom Left: Typical view of stream and view of 18 inch concrete Culvert 11

Bottom Right: Typical view of stream away from railroad

NC DWO Stream Identification Form Version 4.11

05-STR-22

1.5

1.5

Date: 2/2/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.736341
Evaluator: J. Budnik, K. Astroth	County: Hanover County	Longitude: -77.488139
<b>Total Points:</b> 21.25 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*			0.9	
		100		
A. Geomorphology (Subtotal = 7	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1		3
Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0/	0.5	1	1.5
11. Second or greater order channel	( N	0 = 0	Yes	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 5.5)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles		0.5	1	1.5
17. Soil-based evidence of high water table?	(N	0 = 0	Yes	= 3
C. Biology (Subtotal = 8.75)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish		0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
				+

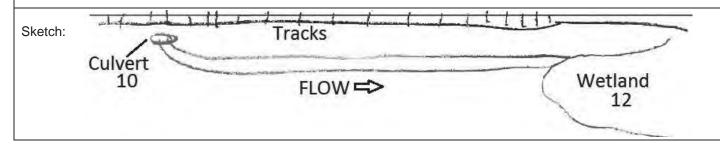
\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Flows into Wetland 12. Field Sheet 13-B-STR-08.

24. Amphibians

26. Wetland plants in streambed

25. Algae



0

0

0.5

0.5

ACW = 0.75 OBL = 1.5 Other = 0

		Stre			ment		-	n 1)			
					lethodology f						
Project #		Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	D	C2RVA - Area		VA	R4SB3	02080206	02/3/2016				
	e(s) of Evalua		Stream Name	e and Informa	tion	05.0	TD 00				
	tchell, K. A				dision (annoine ann	05-S					
. Channel C	Condition: Asse		1		Conditional Categor	у	l D.		l c		
	Opt	imal	1	ptimal  Tew areas of active	Often incised, but I	ginal less than Severe or	Overwider	ned/incised.	1	(or excavated),	
Channel Condition	100% stable banks. protection or natur (80-100%). AND bars/bankfull ber Access to their or fully developed wid Mid-channel bars, few. Transient se	r active erosion; 80- Vegetative surface al rock, prominent I/OR Stable point ches are present. ginal floodplain or e bankfull benches. and transverse bars diment deposition 10% of bottom.	erosion or unproted of banks are s Vegetative protectors by the protector prominent (60 Depositional feat stability. The banchannels are well do has access to be newly developed portions of the sediment covers 10 sediment	cted banks. Majority table (60-80%). titon or natural rock-80%) AND/OR tures contribute to nkfull and low flow effined. Stream likely inkfull benches, or if floodplains along reach. Transient 0-40% of the stream tom.	or Poor due to lo Erosion may be pr both banks. Vegetai 60% of banks. S bevertical or unde 60% of stream is co Sediment may be t contribute or si forming/present. / channels have vege	esent on 40-60% of tive protection on 40 treambanks may rcut. AND/OR 40-	widen further. Ma are near vertical. E. 80% of banks. Ve present on 20-40' insufficient to preve 60-80% of the str sediment. temporary/transi contributing to inst shaped channels protection is prese	unstable. Likely to jority of both banks rosion present on 60 getative protection % of banks, and is ent erosion. AND/OR eat is covered by Sediment is ent in nature, and ability. AND/OR V- shave vegetative ent on > 40% of the didment deposition is	incision, flow cor- banks. Streamb rooting depth, r vertical/undercut. \ present on less the not preventing ero: sloughing present. on 80-100%. AN channel. Greater bed is covered contributing to in	stability. Severe tatained within the delow average hajority of banks equetative protection in 20% of banks, is ion. Obvious banks Erosion/raw banks D/OR Aggrading han 80% of stream by deposition, stability. Multiple diffor subterranean	С
						ntribute to stability.		sent.		w.	
Score	;	3	2	2.4	]	2	1	.6		1	2.0
	Opt	imal	Subo	nditional Cate ptimal		ginal  Low Marginal:	High Poor: Lawns,	por	NOTES>> The wetland pasture and tree cover.		
Riparian Buffers	with > 60% tree c non-maintained un	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrbu and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	tree cover.		
			High	Low	High	Low	High	Low			
Condition Scores	1	.5	1.2	1.1	0.85	0.75	0.6	0.5	]		
. Determine sq	arian areas along e uare footage for ea Riparian Area and S	ach by measuring	or estimating leng	onth and width. Cal	ŭ		of % F	the sums Riparian			
Right Bank	% Riparian Area>	100%						100%			
	Score >	0.6							CI= (Sum % RA * S	cores*0.04\/2	
Loft Dami	% Riparian Area>	100%						100%	Rt Bank CI >	0.60	C
Left Bank	Score >	0.6							Lt Bank CI >	0.60	0.6
	M HABITAT: Va			and depths; wood	y and leafy debris;	stable substrate;	low embededness	; shade; undercut	NOTES>>		
anks, root mats	; SAV; riffle poole	complexes, stable	reatures.	Condition	al Category						
Instream Habitat/ Available	Habitat elements a	imal  are typically present 10% of the reach.	Stable habitat ele present in 30-50% adequate for r	ments are typically of the reach and are maintenance of	Stable habitat eler present in 10-30% of adequate for n	ginal ments are typically of the reach and are naintenance of	Habitat elements lacking or are u elements are typic	s listed above are nstable. Habitat cally present in less			
Cover	-		nonul	lations.	nonul	ations.	than 10% c	of the reach.		ŀ	
Cover		.5		.2	popul	.9		of the reach.	<u> </u>		0.9

	Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX VA			R4SB3	02080206	02/3/2016	05-STR-23	500	1	
CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, poil piles, constrictions, livestock  Conditional Category										
	Negligible	Mir	nor	Mod	erate	Sev	vere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	the channel	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of by any of the chan in the parameter g	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.			
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5	1		

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.92 RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

INSERT PHOTOS:



Left: Typical view of stream an surrounding pastures

Right: Typical view of stream

NC DWQ Stream Identification Form Version 4.11

05-STR-23

<b>Date</b> : 02/03/2016	Project/Site: DC	2RVA - Area 05	Latitude: 37.719228			
Evaluator: D. Mitchell; K. Astroth	County: Hanove	r	Longitude: -77	.493751		
<b>Total Points:</b> 36.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one mitten Perennia				
A. Geomorphology (Subtotal = 14)	Absent	Weak	Moderate	Strong		
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3		
2. Sinuosity of channel along thalweg	0		2	3		
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3		
4. Particle size of stream substrate	0	1	2	3		
5. Active/relict floodplain	0	1	2	3		
6. Depositional bars or benches	0	1	2	3		
7. Recent alluvial deposits	0	1	2	3		
8. Headcuts	0	1	2	3		
9. Grade control	0	0.5	1	1.5		
10. Natural valley	0	0.5	1	1.5		
11. Second or greater order channel	No	= 0	Yes:	= 3		
<sup>a</sup> artificial ditches are not rated; see discussions in manual						
B. Hydrology (Subtotal = 11.5)						
12. Presence of Baseflow	0	1	2	3		
13. Iron oxidizing bacteria	0	11	2	3		
14. Leaf litter	1.5	<u> </u>	0.5	0		
15. Sediment on plants or debris	0	0.5	1	1.5		
16. Organic debris lines or piles	0	0.5	<u> </u>	1.5		
17. Soil-based evidence of high water table?	No	= 0	Yes:	= 3		
C. Biology (Subtotal = $\underline{10.75}$ )						
18. Fibrous roots in streambed	3	2	1	0		
19. Rooted upland plants in streambed	3	2	1	0		
20. Macrobenthos (note diversity and abundance)	0	1	2	3		
21. Aquatic Mollusks	0	1	2	3		
22. Fish	0	0.5	1	1.5		
23. Crayfish	0	0.5	1	1.5		
24. Amphibians	0	0.5	1	1.5		
25. Algae	0	0.5	1	1.5		
26. Wetland plants in streambed		FACW = 0.75	OBL = 1.5 Other = 0	)		
*perennial streams may also be identified using other meth	nods. See p. 35 of manual					
Notes:						
Cow	pasture		Culver	t I		
Sketch:	$\rightarrow$	<u></u>				
_	<del></del>			Railway Ballast		
	Cow pasture					
	•					

### **Ephemeral Stream Assessment Form (Form 1a)**

Unified Stream Methodology for use in Virginia

	For use in ephemeral streams											
Project #	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor			
N/A	DC2RVA - Area 05		VA	R6	02080206	2/4/2016						
Name	e(s) of Evaluator(s)	Stream Nam	e and Inform	ation								
J. Bu	udnik, K. Astroth		05-STR-24									

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

	Conditional Category												
	Optimal	Subo	ptimal	Mar	ginal	Po	oor	Man-made	•				
Riparian Buffers	Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	to 60% tree	Low Suboptimal: Riparian areas with tree stratum (bth > 3 inches) present, with >30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	ephemeral channel/ditch. Poor quality. Field Sheet 13-B-STR-09.					
		High	Low	High	Low	High	Low						
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5						
	arian areas along each stream bar	k into Condition C	Categories and Co	ndition Scores us	sing the	Ensure t	the sums						
descriptors. 2. Determine squelow.	quare footage for each by measuring	ng or estimating le	ngth and width.	Calculators are pr	rovided for you	of % F	Riparian						
B. Enter the % F	Riparian Area and Score for each r	iparian category ir	the blocks below	N.		Blocks e	equal 100						
Right Bank	% Riparian Area> 5%	60%	35%				100%						
g Dank	Score > <b>0.85</b>	0.6	0.5										
								Cl= (Sum % RA * S	Scores*0.01)/2				
Left Bank	% Riparian Area> 10%	45%	45%				100%	Rt Bank CI >	0.58				
_o Juin	Score > 0.85	0.6	0.5					Lt Bank CI >	0.58				

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

THE REACH CONDITION INDEX (RCI) >> 0.29 RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Center: View of 18 inch metal Culvert 19 feeding stream

Top Right: View of 18 inch HDPE Culvert 21 carrying stream under access road

Center Left: Typical view of stream along railroad Center Center: Typical view of stream along railroad

Center Right: View of 16 inch metal Culvert 23 feeding stream

Bottom Right: View downstream of 24 inch metal Culvert 25 under

NC DWQ Stream Identification Form Version 4.11

05-STR-24

Date: 2/4/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.713671
Evaluator: J. Budnik, K. Astroth	County: Hanover County	Longitude: -77.495686
<b>Total Points:</b> 17.75 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Determittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = $5.5$	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	(1)	2	3	
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3	
ripple-pool sequence					
Particle size of stream substrate	0	(1)	2	3	
5. Active/relict floodplain	<b>Q</b>	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	(1)	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley		0.5	1	1.5	
11. Second or greater order channel	( No	0 = 0	Yes:	= 3	
a artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = 5.5 )					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	0	1	(2)	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	No	0 = 0	Yes = 3		
C. Biology (Subtotal = $\underline{6.75}$ )					
18. Fibrous roots in streambed	3	2	(1)	0	
19. Rooted upland plants in streambed	(3)	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	(F)	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		<b>E</b> ACW = 0.75	OBL = 1.5 Other = 0	)	
*perennial streams may also be identified using other methods.	. See p. 35 of manua				
Notes: Man-made ephemeral stream/ditch. Field Sh					
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1 11					
Sketch:	a de la fina de				
211 /ra	ailroad ditch				
1-1 8					
	⟨⊃FL	OW			
	7-1-				
ballast/ acces					
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#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin mpact/SAR Impact Project # **Project Name** HUC Date SAR# Locality Class length Factor DC2RVA - Area 05 VA 02080206 2/4/2016 Stream Name and Information Name(s) of Evaluator(s) 05-STR-25 J. Budnik, K. Astroth 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) Conditional Category NOTES>> Optimal Marginal Field Sheet 13-B-STR Low Marginal: Non-maintained, dense herbaceou ligh Poor: Lawn High Poor: Lawns mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetatee non-maintained area, recently seeded and stabilized, or other comparable condition. 10. High Marginal: Low Suboptimal Riparian areas wit tree stratum (dbh 3 inches) present with >30% tree canopy cover and maintained understory. Recei cutover (dense vegetation). Low Poor: dense herbaceous vegetation, riparian areas lacking shruk and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory. Riparian areas with ree stratum (dbh > Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover. Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions. with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory. Riparian Buffers High Low High Low High Low Condition 1.1 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors Ensure the sums ne square footage for each by measuring or estimating length and width. Calculators are provided for you below of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% 5% 85% 10% Right Bank Score > 0.75 0.6 0.5 Cl= (Sum % RA \* Scores\*0.01)/2 15% 85% 0.60 CI 100% Rt Bank CI > % Riparian Area> Left Bank Score > 0.75 0.6 Lt Bank CI > 0.62 0.61 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

REACH CONDITION INDEX and CIRCLAIN CONDITION CHINC

IOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

| THE REACH CONDITION INDEX (RCI) >> 0.31
| RCI= (Riparian CI)/2
| COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF



Top Left: View upstream toward 18 inch metal Culvert 20 under railroad

Top Right: View downstream

Bottom Left: View downstream from culvert Bottom Right: View upstream toward culvert

Project/Site: DC2RVA - Area 05

NC DWQ Stream Identification Form Version 4.11

Date: 2/4/2016

05-STR-25

**Latitude:** 37.713119

Evaluator: J. Budnik, K. Astroth	County: Hanove	er County	Longitude: -77.495699		
<b>Total Points:</b> 18.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determine Ephemeral Date	nation (circle one) rmittent Perennial	Other e.g. Quad Name:		
A Coomernhalegy (Subtetal 6	Absent	Weak	Moderate	Strong	
A. Geomorphology (Subtotal = 6 )  1 <sup>a.</sup> Continuity of channel bed and bank	0	1		Strong	
	0		2)	3	
<ul><li>2. Sinuosity of channel along thalweg</li><li>3. In-channel structure: ex. riffle-pool, step-pool,</li></ul>			2	3	
ripple-pool sequence	(0)	1	2	3	
Particle size of stream substrate	0	(1)	2	3	
5. Active/relict floodplain	<b>Q</b>	1	2	3	
6. Depositional bars or benches	(0)	1	2	3	
7. Recent alluvial deposits	0	(1)	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	No.	0 = 0	Yes =	= 3	
a artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = 5.5)			_		
12. Presence of Baseflow	0	1	(2)	3	
13. Iron oxidizing bacteria	0	1	(2)	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?		0 = 0	Yes =		
C. Biology (Subtotal = $6.75$ )					
18. Fibrous roots in streambed	3	2	(1)	0	
19. Rooted upland plants in streambed	(3)	2	1	0	
20. Macrobenthos (note diversity and abundance)		(1)	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	8	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed			L = 1.5 Other = 0		
*perennial streams may also be identified using other methods	s. See p. 35 of manua				
Notes: Man-made ephemeral stream/ditch. Field S					
·					
Sketch: yard ditch culvert	Holuse Shrubs	yard			

		Stre		SSESS			) (For	m 1)					
		5 N		wadeable chan	nels classified a			215 "	Impact/SAR	Impact			
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length				
N/A		2RVA - Area		VA	R4SB	02080206	2/4/2016						
	e(s) of Evalua udnik, K. Ast	. ,	Stream Nam	e and Informa	ation	05-91	ΓR-26						
	Condition: Asse		tion of the stream	and provailing o	andition (arasian		111-20						
. Chamilei C				C	Conditional Catego	ry							
	Opti	mai	Subo	ptimal	Iviar	ginal	Po	or	Severe				
		- MAKE		ew areas of active	Poor. Banks more	less than Severe or stable than Severe		unstable. Likely to	Deeply incised	(or excavated),			
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	n or natural rock, 00%). AND/OR bankfull benches as to their original developed wide Mid-channel bars, ars few. Transient	of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes, esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability.		vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank skl. Erosion/raw ban	stability. Severe tained within the do below average hajority of banks ut. Vegetative on less than 20% of venting erosion. Dughing present. ks on 80-100%.			
	sediment depositio		sediment cover	s 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.		vegetative protection is present on > 40% of the banks and stable				CI
Score	3	3	2	.4		2	1.	6	1	l	2.0		
NOTES>>				F	ield Sheet	13-B-STR-1	11.						
. RIPARIAI	N BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh mooguromon			table)				
						ugii illeasureilleil	its of length & widt	th may be accep	itable)				
				ditional Cate	gory				NOTES>>				
	Opti	imal	Subo	Low Suboptimal:	gory Mar High Marginal:	ginal  Low Marginal: Non-maintained, dense herbaceous	Po High Poor: Lawns, mowed,	Or Low Poor:					
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	Suboj  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ptimal Low Suboptimal:	gory Mar	ginal  Low Marginal: Non-maintained,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	or	NOTES>> Left bank o small wetla				
Buffers	Tree stratum (dbh > with > 60% tree co non-maintained und located within the	• 3 inches) present, anopy cower and a derstory. Wetlands e riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/4.00%">https://doi.org/10.100/j.nc/4.00%</a> (anopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Left bank o small wetla				
Buffers	Tree stratum (dbh > with > 60% tree ca	• 3 inches) present, anopy cower and a derstory. Wetlands e riparian areas.	Suboj  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Left bank o small wetla				
Condition Scores  Delineate rip: escriptors. Determine scolow.	Tree stratum (dbh > with > 60% tree co non-maintained und located within the	3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban ach by measurin	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both oherbacepos and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Left bank o small wetla				
Condition Scores  Delineate rips scriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	5 3 inches) present, anopy cover and a detestory. Wetlands e riparian areas.  5 each stream ban ach by measurin Score for each r 60%	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Lategories and Coungth and width. ( In the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- more acceptable of the condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Left bank o small wetla				
Condition Scores  Delineate rips scriptors. Determine scolow. Enter the % I	Tree stratum (dbh ) with > 60% tree ca non-maintained und located within the located with	- 3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban ach by measurin	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Lategories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- more acceptable of the condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100	NOTES>> Left bank o small wetla	and.			
Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % I	Tree stratum (dbh > with > 60% tree oc non-maintained und located within the located with	5  sach stream ban ach by measurin Score for each r 60% 0.75  30%	Subor  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.6	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Lategories and Co ngth and width. ( n the blocks below 20% 0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- more acceptable of the condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100	NOTES>> Left bank c small wetla  Cl= (Sum % RA*S Rt Bank CI>	cores*0.01)/2	CI		
Condition Scores  Delineate ripsecriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree co non-maintained und located within the located with	5  each stream ban ach by measurin Score for each r 60% 0.75	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.6	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. (and the blocks below 0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>> Left bank c small wetla  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	oores*0.01)/2	CI 0.72		
Condition Scores  Delineate rips secriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree oc non-maintained und located within the located with	5  sach stream ban ach by measurin 60% 0.75  30% 1.2  aried substrate si	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category it 20% 0.6  55% 0.6  Zes, water velocit	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  categories and Co ngth and width. ( n the blocks below 20% 0.5  15% 0.5  y and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>> Left bank c small wetla  Cl= (Sum % RA*S Rt Bank CI>	cores*0.01)/2			
Condition Scores  Delineate rippescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAL	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	5  sach stream ban sach by measurin Score for each r 60% 0.75  1.2  aried substrate siffle poole comple	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in 20%  0.6  55%  0.6  zes, water velocitiexes, stable features.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Sategories and Co ngth and width. ( n the blocks below 20% 0.5  15% 0.5  y and depths; wores. Conditiona	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- more and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed	Low Poor: Impervious Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>> Left bank c small wetla  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2			
Condition Scores  Delineate rippescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree oz non-maintained und located within the located with	5  sach stream ban ach by measurin 60% 0.75  30% 1.2  aried substrate siffle poole completimal	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.6  55% 0.6  zes, water velocit exes, stable featur  Subol Stable habitat elei	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. (and the blocks below 20% 0.5  15% 0.5  by and depths; wo res.  Conditional primal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  W.  In Category  Mar  Stable habitat ele	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks end Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Left bank c small wetla  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2			
Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream	Tree stratum (dbh > with > 60% tree oz non-maintained und located within the located with	5  sach stream ban sach by measurin Score for each r 60% 0.75  1.2  aried substrate siffle poole comple	Suboy  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both ontaining  Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. (and the blocks below 0.5  15% 0.5  y and depths; wores.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrud layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High 0.85  Calculators are provided at Category Mar Stable habitat ele present in 10-30 are adequate for are dequate for a sea dequate for a se	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you  pris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tf  of % R  Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%  100%	NOTES>> Left bank of small wetland wet	cores*0.01)/2				

Stream Impact Assessment Form Page 2											
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor		
N/A	CSX		VA	R4SB	02080206	2/4/2016	05-STR-26				
	CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, nkments, spoil piles, constrictions, livestock  Conditional Category  NOTES>>  Driveway crossing										
	Negligible	Mi	nor	Mod	erate	Sev	Severe stream. Stream flo				
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed		through cu	ilvert.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5	1			

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: View of 18 inch metal Culvert 26 under road

Top Right: View of 18 inch metal Culvert 27

Bottom Left: Typical view of stream

Bottom Right: View of confluence of STR-11 (left) with STR-09 (right)

Project/Site: DC2RVA - Area 05

NC DWQ Stream Identification Form Version 4.11

Date: 2/4/2016

05-STR-26

Latitude: 37.709088

Evaluator: J. Budnik, K. Astroth County: Hanover County Longitude: -77.497096									
<b>Total Points:</b> 28.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determ Ephemeral Inte	ination (circle one) ermittent Perennial	Other e.g. Quad Name:						
A. Geomorphology (Subtotal = 9)	Absent	Weak	Moderate	Strong					
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3					
Sinuosity of channel along thalweg	0		2	3					
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3					
Particle size of stream substrate	0	(1)	2	3					
5. Active/relict floodplain	0	1	(2)	3					
6. Depositional bars or benches	0	(1)	2	3					
7. Recent alluvial deposits	0_	(1)	2	3					
8. Headcuts	0	1	2	3					
9. Grade control	0	0.5		1.5					
10. Natural valley	0	0.5	1	1.5					
11. Second or greater order channel	N	0 = 0	Yes:						
a artificial ditches are not rated; see discussions in manual									
B. Hydrology (Subtotal = 11 )									
12. Presence of Baseflow	0	1	2	(3)					
13. Iron oxidizing bacteria	0	1	2	(3)					
14. Leaf litter	1.5	(1)	0.5	0					
15. Sediment on plants or debris	0	0.5	1	1.5					
16. Organic debris lines or piles	0	0.5	1 _	1.5					
17. Soil-based evidence of high water table?		0 = 0	Yes:						
C. Biology (Subtotal = 8.75									
18. Fibrous roots in streambed	3	(2)	1	0					
19. Rooted upland plants in streambed	(3)	2	1	0					
20. Macrobenthos (note diversity and abundance)	<del>                                     </del>	$\overline{1}$	2	3					
21. Aquatic Mollusks	Ô	1	2	3					
22. Fish	<del>                                     </del>	0.5	1	1.5					
23. Crayfish	0	0.5	1	1.5					
24. Amphibians	0	0.5	1	1.5					
25. Algae	0	0.5	1	1.5					
26. Wetland plants in streambed	0	0.0	L = 1.5 Other = 0						
*perennial streams may also be identified using other method	ls See n 35 of manus		L = 1.5 Other = 0	,					
Notes: Field Sheet 13-B-STR-11.	Осо р. 30 01 manu	uı.							
140tes. Field Officer to B CTR TT.									
Sketch: Wetland 13 /	driveway	ballast	Stream 9						
Suive	12/	culvert							

# Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

				0,							
For use in ephemeral streams											
Project #	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor		
N/A	DC2RVA - Area 05		VA	R6	02080206	2/4/2016					
Name	e(s) of Evaluator(s)	Stream Nam	e and Inform	ation							
J. Bu	udnik, K. Astroth		05-STR-27								

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

			Con	ditional Cate	gory				NOTES>>		
	Optimal		Subo	ptimal	Mar	ginal	Po	oor	Yard on bo	oth sides	
Riparian	Tree stratum (dbh > 3 inches) with > 60% tree canopy cover non-maintained understoy. W areas.	present, r and an	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover:	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
			High	Low	High	Low	High	Low			
Condition Scores	1.5		1.2	1.1	0.85	0.75	0.6	0.5			
escriptors.	rian areas along each strea					•		the sums Riparian			
. Enter the % R	iparian Area and Score for	r each rip	arian category in	the blocks below	v.		Blocks e	equal 100			
Right Bank	% Riparian Area> 80°	%	20%					100%			
Nigill Dailk	Score > 0.6	6	0.5								
									CI= (Sum % RA * S	cores*0.01)/2	
	% Riparian Area> 80°	0/2	20%					100%	Rt Bank CI >	0.58	4
Left Bank	% Ripalian Areas	70	2070								

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> 0.29 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: View upstream, away from railroad Top Right: View downstream, toward railroad Bottom Left: 12 inch metal Culvert 01 under railroad

Bottom Right: Confluence with stream from Segment 13 (adjacent railroad)

NC DWQ Stream Identification Form Version 4.11

05-STR-27

1.5

1.5

FACW = 0.73; OBL = 1.5 Other = 0

Date: 2/4/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.707171
Evaluator: J. Budnik, K. Astroth	County: Hanover County	Longitude: -77.497421
<b>Total Points:</b> 16.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*	Ephemeral	rmittent Perenniai	e.g. Quad Name:		
A. Geomorphology (Subtotal = 5)	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
Sinuosity of channel along thalweg	0	(1)	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
Particle size of stream substrate	0	<b>①</b>	2	3	
5. Active/relict floodplain	<b>Q</b>	1	2	3	
6. Depositional bars or benches	(0)	1	2	3	
7. Recent alluvial deposits	0	1)	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	( No	= 0	Yes = 3		
a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 5.5		4			
12. Presence of Baseflow	0	1	2	(3)	
13. Iron oxidizing bacteria	0	(1)	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	No = 0		Yes = 3		
C. Biology (Subtotal = $5.75$			_		
18. Fibrous roots in streambed	3	2	(1)	0	
19. Rooted upland plants in streambed	3	(2)	<u>ī</u>	0	
20. Macrobenthos (note diversity and abundance)	0	<b>(1)</b>	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	<b>O</b>	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet: 14-B-STR-01.

26. Wetland plants in streambed

24. Amphibians

25. Algae

Sketch:

Culvert 1

Yard

FLOW

Yard

0

		Stre			ment lethodology f		) (For	m 1)			
Project #		Project Name		wadeable chan	nels classified a Cowardin	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact	
•				•	Class.			SAN#	length	Factor	
N/A Nam	DC2RVA - Area 05 VA e(s) of Evaluator(s) Stream Name and Inform			R2SB ation	02080206	2/4/2016					
	udnik, K. Ast	. ,				R-28 (Ch	ickahomii	nv River)	,		
. Channel C	Condition: Asse	ess the cross-sec	tion of the stream	and prevailing co				.,,			
	Optimal		Suboptimal Co		Conditional Category  Marginal		Poor		Severe		
	The same of the sa		The state of the s		Often incised, but less than Severe or Poor, Banks more stable than Severe		Overwidend Vertically/laterally		1		
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars' are present. Acce floodplain or fully bankfull benches. and transverse be sediment depositio	Very little incision or active erosion; 80, 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than		cted banks. Majority able (60-80%). ion or natural rock 80%) AND/OR ures contribute to lkfull and low flow I defined. Stream beankfull benches, d floodplains along each. Transient	y or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40- 60% of stream is covered by sediment. Sediment may be temporary/transient, contribute		widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in		s Leeply included to exclavate of the control of th		
	10% of bottom.		bottom.	vegetative protection on > 40% of the banks and depositional features which contribute to stability.				deposition, contributing to instability.  Multiple thread channels and/or subterranean flow.		CI	
Score	3	3	2	.4	2		1.6		1		3.0
NOTES>>				Fi	eld Sheet:	14-B-STR-0	)2.				
. RIPARIAI	N BUFFERS: A	Assess both bank	d's 100 foot riparia	n areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt	h may be accep	table)		
				ditional Cate					NOTES>>		
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed	Low Poor: Impervious surfaces, mine spoil lands,	ed		
			herbaceous and shrub layers or a non-maintained understory.	maintained understory. Recent cutover (dense vegetation).	inches) present, with <30% tree canopy cover.	production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
			herbaceous and shrub layers or a non-maintained	understory. Recent cutover (dense	inches) present, with <30% tree	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with	vegetated non- maintained area, recently seeded and stabilized, or other comparable	surfaces, row crops, active feed lots, trails, or other comparable			
Condition Scores	1.	5	herbaceous and shrub layers or a non-maintained understory.	understory. Recent cutover (dense vegetation).	inches) present, with <30% tree canopy cover.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Scores  1. Delineate ripadescriptors. 2. Determine sopelow.	1. arian areas along of quare footage for e	each stream ban each by measurin	herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	understory. Recent cutover (dense vegetation).  Low 1.1  ategories and Congth and width. (	inches) present, with <30% tree canopy cover.  High 0.85  Indition Scores us Calculators are present.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
Scores  Delineate ripalescriptors. Determine scoelow.	arian areas along of quare footage for e Riparian Area and % Riparian Area>	each stream ban each by measurin Score for each r 30%	herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating let parian category in 60%	Low 1.1 ategories and congth and width. Conthe blocks below	inches) present, with <30% tree canopy cover.  High 0.85  Indition Scores us Calculators are present.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
Scores  Delineate ripidescriptors. Determine scoelow. B. Enter the % I	arian areas along of quare footage for e Riparian Area and	each stream ban each by measurin Score for each r	herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating ler parian category in	understory. Recent cutover (dense vegetation).  Low 1.1  ategories and Congth and width. Congth and width. Congth blocks below	inches) present, with <30% tree canopy cover.  High 0.85  Indition Scores us Calculators are present.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums iparian qual 100	C⊫ (Sum % RA * Si	cores*0.01)/2	
Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I	arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >	each stream ban each by measurin Score for each r 30% 0.85	herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating let parian category in 60% 1.1	Low 1.1 ategories and Congth and width. Conthe blocks below 1.9 1.0%	inches) present, with <30% tree canopy cover.  High 0.85  Indition Scores us Calculators are present.	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums iparian qual 100	CI= (Sum % RA * Si Rt Bank CI >	0.97	CI
Scores  Delineate ripidescriptors. Descriptors. rian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >	each stream ban ach by measurin Score for each r 30% 0.85	herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating let parian category in 60% 1.1  10% 0.6	understory. Recent cutover (dense vegetation).  Low 1.1  ategories and Congth and width. Congth and width. Congth and width. Congth and Congth and Congth and Congth and Congth and Congth and Congth and Congth and Congth and Congth and Congth and Congth and Congth and Congth and Cong	inches) present, with <30% tree canopy cover.  High 0.85  Indicators are prov.	open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt  of % R  Blocks ed	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Les sums iparian qual 100 100%	Cl≕ (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	,	CI 1.14	
Scores  Delineate ripitescriptors. Determine scielow. Enter the % I Right Bank  Left Bank  INSTREAI	arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >	each stream ban ach by measurin Score for each r 30% 0.85 80% 1.5 aried substrate si	herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating ler parian category in 60% 1.1  10% 0.6 Zes, water velocit	Low 1.1 ategories and Congth and width. Congth and width. Congth and width. Congth and depths; wores.	inches) present, with <a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">http</a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a>	open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt  of % R  Blocks ed	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Les sums iparian qual 100 100%	CI= (Sum % RA * Si Rt Bank CI >	0.97	
Scores  Delineate ripidescriptors. Descriptors. uare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  % Riparian Area> root mats; SAV; ri	each stream ban each by measurin Score for each r 30% 0.85  80% 1.5  aried substrate si	herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating ler parian category in 60% 1.1  10% 0.6  zes, water velocitexes, stable features.	Low 1.1 ategories and Congth and width. Conthe blocks below 0.5 y and depths; wo	inches) present, with <a href="https://www.ncbests.org/library.com/">https://www.ncbests.org/<a href="https://www.ncbests.org/">https://www.ncbests.org/<a hre<="" td=""><td>open water. If present, tree stratum (dbh &gt;3 inches) present, with &lt;30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you</td><td>vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt  of % R  Blocks ed</td><td>surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums sparian qual 100  100%  100%</td><td>Cl≕ (Sum % RA * Si Rt Bank Cl &gt; Lt Bank Cl &gt;</td><td>0.97</td><td></td></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a>	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt  of % R  Blocks ed	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums sparian qual 100  100%  100%	Cl≕ (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	0.97		
Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAL	arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Varoot mats; SAV; ri	seach stream ban ach by measurin Score for each r 30% 0.85  80% 1.5 aried substrate si	herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating ler parian category in 60% 1.1  10% 0.6  Zes, water velocitexes, stable feature.  Subool Stable habitat eler	Low 1.1 ategories and Congth and width. Congth a	inches) present, with <30% tree canopy cover.  High 0.85  Indicate of the condition of the	open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100 100%  100%  or iness; shade;	Cl≕ (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	0.97	
Scores  Delineate ripidescriptors. Delice repidescriptors. Determine scoelow. Delice repidescriptors.	arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Varoot mats; SAV; ri	seach stream ban ach by measurin 30% 0.85  80% 1.5 aried substrate si ffle poole completimal re typically present	herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating ler parian category in 60% 1.1  10% 0.6  zes, water velocit exes, stable feature Subol Stable habitate ler present in 30-50%	understory. Recent cutover (dense vegetation).  Low  1.1  ategories and Congth and width. Congth and width. Congth and depths; wo less.  Conditional congtinual control of the reach and congtinual remaintenance of maintenance of conditional control of the reach and congular conditional control of the reach and congular conditional control of the reach and congular congular conditional congular conditional congular	inches) present, with <a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">https://www.ncbests.org/libraries/<a href="https://www.ncbests.org/libraries/">http</a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a>	open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substructions sale substructions of the substruction of th	vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks en ate; low embeded	surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100 100%  100%  Ilisted above are stable. Habitat lily present in less	CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI > NOTES>>	0.97	

Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02080206	2/4/2016	05-STR-28		
CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, mbankments, spoil piles, constrictions, livestock      Conditional Category									
	Negligible Mi		nor	Moderate		Severe			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	30% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or lent.		

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: Typical view of Chickahominy River Top Right: Typical view of Chickahominy River Bottom Left: View of railroad over Chickahominy River Bottom Right: View of powerline ROW over Chickahominy River

NC DWQ Stream Identification Form Version 4.11 Chickahominy River 05-STR-28

Date: 2/4/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.700454
Evaluator: J. Budnik, K. Astroth	County: Hanover/Henrico Boundary	Longitude: -77.499840
<b>Total Points:</b> $36.25$ Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 13.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence	U		2	3
4. Particle size of stream substrate	0	$\epsilon$	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	<b>(</b> 1 <b>)</b>	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual	•			
B. Hydrology (Subtotal = 10.5)				_
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	1 _	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	
C. Biology (Subtotal = 12.25 )				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5	(1)	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.73;	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other method	ds. See p. 35 of manua	al.		
Notes: Chickahominy River. Field Sheet: 14-B-S7				
·				
CALLER PRINCIPLE	2			
Sketch: bars Wetland		111		
~		-		
C C EIO	ws>			
120	~	1		
The state of the s		1		
	No. of Concession, Name of Street, or other Party of Street, or other	111		

		Stre	Unit	fied Stream M	lethodology f	or use in Virg		m 1)			
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	05	VA	R2SB	02080206	2/4/2016		length	1 doloi	
Nam	ne(s) of Evalua	itor(s)	Stream Nam	e and Informa	ation						
J. B	Budnik, K. As	troth				05-ST	R-29a				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal	onditional Catego Mar	ry ginal	Po	or	Sev	ere	
	7	L MA	1		Often incised, but	less than Severe or	Overwiden	ed/incised.	1	5	
Channel Condition	surface protectio prominent (80-1 Stable point bars, are present. Acce floodplain or fully bankfull benches, and transverse ba	or active erosion; 80- inks. Vegetative on or natural rock, 100%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	ew areas of active ted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, of floodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vegei 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositio stability, may be	stable than Severe wer bank slopes. essent on 40-60% of tative protection on Streambanks may errut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	Deeply incised vertical/lateral in incision, flow cor banks. Streambe rooting depth, rr vertical/lunderc protection present of banks, is not pre Obvious bank sk Erosion/raw ban AND/OR Aggradin.	stability. Severe tained within the dd below average ajority of banks ut. Vegetative in less than 20% of venting erosion. bughing present. ks on 80-100%.	
		on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depor	ks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	c
Score	;	3	2	.4		2	1.	6	1		2.
2. RIPARIAI	N BUFFERS:	Assess both bank	's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	h may be accep	table)		
2. RIPARIAI	N BUFFERS: /	Assess both bank	Con	an areas along the ditional Cate ptimal	gory	ugh measuremen	ts of length & wid		notes>>		
2. RIPARIAI Riparian Buffers	Opt Tree stratum (dbh: with > 60% tree ci.		Con	ditional Cate	gory						
Riparian Buffers	Opt Tree stratum (dbh: with > 60% tree ci.	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opt  Tree stratum (dbh: with > 60% tree c: non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Opt  Tree stratum (dbh: with > 60% tree c: non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  .5  each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree ci non-maintained un located within th  1 parian areas along quare footage for e Riparian Area and	imal  > 3 inches) present, anopy cover and a deterstory. Wetlands he riparian areas.  .5  each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 45%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %	Tree stratum (dbh with > 60% tree ci non-maintained un located within th	imal  > 3 inches) present, anopy cover and a deterstory. Wetlands he riparian areas.  .5  each stream ban each by measuring score for each ries and sc	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both abrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums iparian qual 100		cores*0.01)/2	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %	Tree stratum (dbh: with > 60% tree ci. non-maintained un located within th located within th  arian areas along quare footage for e Riparian Area and % Riparian Area> % Riparian Area>	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  .5  each stream ban each by measurin  Score for each ri  45%  1.2	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 45% 1.1	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 10% 0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums iparian qual 100	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >	1.09	С
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the %  Right Bank	Tree stratum (dbh: with > 60% tree ci non-maintained un located within th located within th  aparian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a deterstory. Wetlands he riparian areas.  5  each stream ban each by measurin  Score for each ri  45%  1.2	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating leeparian category in 45% 1.1	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. ( n the blocks below 10% 0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denude surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >		C 1.0
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree ci. non-maintained un located within th located within th  arian areas along quare footage for e Riparian Area and % Riparian Area> % Riparian Area>	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  .5  each stream ban each by measurin  Score for each ri  45%  1.2  45%  1.2  arried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category it 45% 1.1  45% 1.1  zes, water velocit	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. ( n the blocks belov 10% 0.5  ty and depths; wores.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provinced to the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denude surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >  Lt Bank CI >  NOTES>>	1.09	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	Tree stratum (dbh with > 60% tree conon-maintained un located within the located within t	imal  > 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  .5  each stream ban each by measurin  Score for each ri  45%  1.2  45%  1.2  aried substrate si iffle poole complete.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 45% 1.1  45% 1.1  zes, water velocit exes, stable feature	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 10% 0.5  10% 0.5  ty and depths; wores.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provinced to the condition of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t     of % R     Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.09	
Condition Scores  Delineate rip descriptors. Left Bank  Left Bank  Left Bank  INSTREAl undercut banks; Instream Habitat/ Available	Tree stratum (dbh with > 60% tree ci non-maintained un located within th located within th sarian areas along quare footage for e Riparian Area and % Riparian Area > Score > M HABITAT: V; root mats; SAV; r	imal  > 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  5.5  each stream ban each by measurin  2 Score for each ri  45%  1.2  45%  1.2  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 45% 1.1  zes, water velocit exes, stable featur  Subo  Stable habitat elp present in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 10% 0.5  10% 0.5  ty and depths; wo res.  Conditiona ptimal ments are typically % of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically & of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % Reserved Blocks estable Blocks	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	C  = (Sum % RA * S Rt Bank CI > Lt Bank CI > Varied sub	1.09 1.09 strate,	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree ci. non-maintained un located within th  located within th  arian areas along quare footage for e  Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: V. ; root mats; SAV; r  Opt  Habitat elements a in greater than 5	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  .5  each stream ban each by measurin  Score for each ri  45%  1.2  45%  1.2  daried substrate si ifffle poole completimal	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Kinto Condition C g or estimating le parian category in 45% 1.1  Zes, water velocit exes, stable featur  Subo Stable habitat ele present in 30-509 are adequate fo popul	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 10% 0.5  ty and depths; wo res.  Conditional ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%  100%	C  = (Sum % RA * S Rt Bank CI > Lt Bank CI > Varied sub riffle-pool	1.09 1.09 strate,	

	St	ream In	npact A	ssessm	ent Fo	rm Pag	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02080206	2/4/2016	05-STR-29a		
	L ALTERATION: Stream cross poil piles, constrictions, livestock	sings, riprap, conc		concrete blocks,	straightening of c	hannel, channeli	zation,	NOTES>>	
	Negligible	Mi	nor		erate	Se	vere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than a disrupted by an alterations listed guidelines AND/shored with ga	80% of reach is yo of the channel in the parameter OR 80% of banks abion, riprap, or nent.		

## REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:



NC DWQ Stream Identification Form Version 4.11

05-STR-29a

Date: 2/4/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.698374
Evaluator: J. Budnik, K. Astroth	County: Henrico County	Longitude: -77.500172
<b>Total Points:</b> 36.5 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 18)	Absent	Weak	Moderate	Strong
a. Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
B. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	<b>(2)</b>	3
B. Headcuts	0	1)	2	3
9. Grade control	0	0.5	1	1.5
0. Natural valley	0	0.5	1	1.5
1. Second or greater order channel	No	0 = 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 7				
2. Presence of Baseflow	0	1	2	(3)
3. Iron oxidizing bacteria	0	1	(2)	3
4. Leaf litter	1.5	1	0.5	0
5. Sediment on plants or debris	0	0.5	1	1.5
6. Organic debris lines or piles	0	0.5	1	1.5
7. Soil-based evidence of high water table?	No	0 = 0	Yes :	= 3
C. Biology (Subtotal = 11.5)			•	
8. Fibrous roots in streambed	3	(2)	1	0
9. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	(1)	2	3
2. Fish	0	0.5	1	1.5
3. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5	1	1.5
6. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method	ods. See p. 35 of manua	al.		
Notes: Field Sheet: 14-B-STR-3.				

FLOW

		Stre				Form	) (For	m 1)			
		Desired No.			nels classified a	s intermittent or		0.45 "	Impact/SAR	Impact	
Project #		Project Name	9	Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R2SB	02080206	2/4/2016				
Nam	e(s) of Evalua  D. Mitchell	tor(s)	Stream Nam	e and Informa	ation	05 ST	R-29b				
Channel C	Condition: Asse	one the erece see	ation of the atroom	and provoiling o	andition (arasian		K-290				
. Chainlei C				C	Conditional Catego	ry	l De		Sev		
	Opti	ımaı	Subo	ptimal	Iviar	ginal	Po	or	Sev	ere	
	"	We have		ew areas of active	Poor. Banks more	less than Severe or stable than Severe		unstable. Likely to	Deeply incised		
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse bar	n or natural rock, 00%). AND/OR /bankfull benches ess to their original	of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope portions of the r	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to akfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran instability. Depositi stability, may be	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Majare near vertical. E 60-80% of banl protection preset banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrict AND/OR V-shape	rosion present on ks. Vegetative and on 20-40% of fficient to prevent & 60-80% of the do by sediment. corary/transient in justing to instability. Ed channels have	vertical/lateral in incision, flow cor banks. Streambe rooting depth, n vertical/underc protection present obanks, is not pre Obvious bank sl. Erosion/raw bar AND/OR Aggradin	tained within the bed below average najority of banks ut. Vegetative sets than 20% of eventing erosion. Dughing present. ks on 80-100%.	
	10% of			s 10-40% of the bottom.	vegetative protecti banks and deposit	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depos	ks and stable	than 80% of stream deposition, contrib Multiple thread subterran	uting to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1		2.4
NOTES>>				Fi	eld Sheet:	14-A-STRN	l-1.				
2. RIPARIAI	N BUFFERS: A	Assess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt	h may be accep	table)		
2. RIPARIAI			Con	ditional Cate	gory				ntable)		
Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained		gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation,	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable		NOTES>>		
Riparian	Option  Tree stratum (dbh with > 60% tree canon-maintained und	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Suboy High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>>		
Riparian Buffers	Opti Tree stratum (dbh with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>>		
Riparian	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>		
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so	Opti	imal  - 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  -5  -5  -6  -5  -5  -6  -6  -6  -6  -7  -7  -7  -7  -7  -7	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>		
Riparian Buffers  Condition Scores  Delineate ripiescriptors. 2. Determine scores	Tree stratum (dbh a with > 60% tree cc non-maintained una located within the located with	imal  3 inches) present, anopy cover and a derstory. Wellands e riparian areas.  5  each stream ban each by measuring Score for each r 100%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>		
Riparian Buffers  Condition Scores  Delineate rip. lescriptors. Determine scoelow. Enter the % lescriptors.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strain areas along a quare footage for e	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>	cores*0.01V2	
Riparian Buffers  Condition Scores  Delineate ripidescriptors. 2. Determine scorelow. 3. Enter the % I	Tree stratum (dbh a with > 60% tree cc non-maintained una located within the located with	imal  3 inches) present, anopy cover and a derstory. Wellands e riparian areas.  5  each stream ban each by measuring Score for each r 100%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>	cores*0.01)/2	CI
Condition Scores  Delineate ripilescriptors. Delermine scoledow. Enter the % I	Tree stratum (dbh : with > 60% tree cc conon-maintained une located within the located wi	imal  3 inches) present, anopy cover and a deferstory. Wellands e riparian areas.  5  each stream ban each by measurin  Score for each r  100%  1.2	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  CI= (Sum % RA * S		CI 1.20
Riparian Buffers  Condition Scores  Delineate riplescriptors. Determine scolelow. Right Bank  Left Bank  B. INSTREAL	Tree stratum (dbh : with > 60% tree conon-maintained und located within th  1. arian areas along to a conon-maintained and within the conon cono	imal  3 inches) present anopy cover and a derstory. Wetlands derstory. Wetlands er iparian areas.  5  each stream ban each by measurin 100% 1.2  100% 1.2  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	1.20	
Condition Scores  Delineate rip: descriptors. Descriptors. Right Bank  Left Bank  Left Bank  INSTREAL	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5.5  each stream ban each by measuring Score for each race of the stream ban 1.2  100% 1.2  arried substrate siffle poole complete.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure the of % R Blocks etc.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 10.5  L	CI= (Sum % RA * S Rt Bank CI > Lt Bank CI > Varied sub	1.20	
Riparian Buffers  Condition Scores  Delineate rip: Jescriptors. Descriptors. Left Bank  Right Bank  Left Bank  Instream Habitat/	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th  1. arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  M HABITAT: Va ; root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands to riparian areas.  5  each stream ban each by measurin Score for each r 100% 1.2  100% 1.2  aried substrate si iffle poole completimal	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in interpretation of the content of the c	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below the product of the blocks below the product	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  W.  In Category  Mar  Stable habitat ele	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substrations are typically ments are typically ments are typically ments are typically substrated in the control of the	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks end Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	1.20 1.20 strate,	
Condition Scores  1. Delineate rip- descriptors. 2. Determine scoelow. Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th  1. arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  M HABITAT: Va ; root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  5.5  each stream ban each by measuring Score for each race to 100% 1.2  100% 1.2  arried substrate si fifte poole completimal  re typically present	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in the containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Tategories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrud layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High 0.85  Calculators are provided at Category Mar Stable habitat ele present in 10-30 are adequate for are dequate for a sea dequate for a se	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you  pris; stable substr	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tf  of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > Varied sub riffle-pool complexes	1.20 1.20 strate,	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Date Data Point SAR length Impact Factor Project # N/A R2SB 02080206 2/4/2016 05-STR-29b 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach is disrupted by any of the channel alterations listed in stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. CI SCORE 1.5 0.5 1.3 1.1 0.9 0.7 1.30

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



NC DWQ Stream Identification Form Version 4.11

05-STR-29b

Date: 2/4/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.688251
Evaluator: D. Mitchell	County: Henrico County	Longitude: -77.501984
<b>Total Points:</b> 35.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

Strong
3
3
3
3
3
3
3
3
1.5
1.5
: 3
<del>ノ</del>
(3)
3
0
1.5
1.5
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0
0
3
3
1.5
1.5
1.5
1.5

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Impact Cowardin Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 05 02080206 2/4/2016 Stream Name and Information Name(s) of Evaluator(s) D. Mitchell 05-STR-30 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** Optimal Suboptimal Marginal Left bank is ballast Low Marginal: Non-maintained, High Poor: Lawns, mowed for railbed. Field ligh Suboptima High Marginal: Riparian areas ense herbaceou Sheet: 14-A-STRM-3 Riparian areas and maintained Low Poor: vegetation, riparian areas with tree stratur Non-maintained with tree stratum (dbh > 3 inches) areas, nurseries (dbh > 3 inches) ense herhaceou no-till cropland vegetation with either a shrub present, with acking shrub and Tree stratum (dbh > 3 inches) presen spoil lands, resent, with 30% to 60% tree actively grazed Riparian 30% tree canon tree stratum, hav pasture, sparsely vegetated non-maintained area, with > 60% tree canopy cover and ar enuded surface cover and a maintained roduction, ponds open water. If laver or a tree canopy cover an containing both row crops, active eed lots, trails, or **Buffers** non-maintained understory. Wetland layer (dbh > 3 inches) present, understory present, tree herbaceous and recently seeded ther comparable Recent cutover with <30% tree stratum (dbh >3 shrub layers or a non-maintained and stabilized, o conditions. (dense vegetation). canopy cover. inches) present, with <30% tree understory canopy cover with maintained High High High Low Low Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 50% 50% 100% Right Bank 1.5 0.75 Score > CI= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > 1.13 CI Left Bank Lt Bank CI > 0.50 0.81 Score > 0.5

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> 0.41

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

## INSERT PHOTOS:



Typical view of stream

Project/Site: DC2RVA - Area 05

NC DWQ Stream Identification Form Version 4.11

Date: 2/4/2016

05-STR-30

Latitude: 37.682103

Evaluator: D. Mitchell	County: Henric	o County	Longitude: -77	7.502690
<b>Total Points:</b> 18.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determ Ephemeral Inte	ination (circle one) ermittent Perennial	Other e.g. Quad Name	:
A Coomerphology (Subtetal 9	Absent	Weak	Moderate	Strong
A. Geomorphology (Subtotal = 9 )  1 <sup>a.</sup> Continuity of channel bed and bank	Absent 0	vveak		
-	0		2	3
<ul><li>2. Sinuosity of channel along thalweg</li><li>3. In-channel structure: ex. riffle-pool, step-pool,</li></ul>	U			3
ripple-pool sequence	0		2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	<b>a</b>	1	2	3
6. Depositional bars or benches		1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0		2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5	0	1.5
11. Second or greater order channel	<b>(</b> N	0 = 0	Yes	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $2.5$ )				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0 -	0.5	1	1.5
17. Soil-based evidence of high water table?		0 = 0	Yes	
C. Biology (Subtotal = 7				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	<b>6</b>	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	_
*perennial streams may also be identified using other meth	ods. See p. 35 of manua			
Notes: Field Sheet: 14-A-STRM-3.	·			
Sketch:	-11+	++	##	
Wetland 2	eam 3	Stream	2	

# Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

		For us	e in ephemeral s	treams				
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Area 05	VA	R6	02080206	2/4/2016			

Name(s) of Evaluator(s) Stream Name and Information

05-STR-31 D. Mitchell

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Con	ditional Cate	gory			
	Optimal	Subo	ptimal	Mar	ginal	Po	oor
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	Riparian areas with	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	vegetation with either a shrub layer or a tree layer (dbh	ponds, open water.	cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.
		High	Low	High	Low	High	Low
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5
Delineate ripa	rian areas along each stream bank	into Condition Cat	egories and Cond	tion Scores using	the descriptors.	Ensure t	the sums

NOTES>> Score for wooded area. After stream became railside it changes to L = 100% 0.5, R= 20% 0.6, 80% 1.5. Field Sheet: 14-A-STRM-2.

2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you

of % Riparian

3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

Blocks equal 100

100% % Riparian Area> 100% Right Bank Score > 1.5

CI= (Sum % RA \* Scores\*0.01)/2 Rt Bank CI > 1.50

100% % Riparian Area> Left Bank Score > 1.5

100%

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

CI

1.50

0.75

0

THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2

Lt Bank CI >

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Top Rigjt: Typical view of stream away from railroad Bottom Left: Culvert

Bottom Right: 24 inch concrete Culvert 13

NC DWQ Stream Identification Form Version 4.11

05-STR-31

Date: 2/4/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.680833
Evaluator: D. Mitchell	County: Henrico County	Longitude: -77.502826
<b>Total Points:</b> 16.25 Stream is at least intermittent if ≥ 19 or perennial if ≥ $30^*$	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 3)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
Sinuosity of channel along thalweg	(0)	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	8	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	6	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	(N	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $5.5$			<del>,</del>	
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	= 3
C. Biology (Subtotal = $7.75$ )				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		ACW = 0.75	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other methods. See				
Notes: Feature appears to be a straight dug ditch, likely	/ built to drai	in surrounding ar	ea for pine cultivati	on. Field
Sheet: 14-A-STRM-2.				
Sketch: logging road culvert Stream 2	<b>\$</b> \$	Ŭ,		

	Impact	Impact/SAR		perennial	intermittent or p	Cowardin					
	Factor	length	SAR#	Date	HUC	Class.	Locality		Project Name	P	Project #
				06/09/2016	02080106	R2SB3	VA e and Informa		2RVA - Area (	DC2 e(s) of Evaluate	N/A
				R-B-01	05-STI	шоп	e and imorna	Stream Name		ering, R. Ma	
						dition (erosion, agg	and prevailing cond	on of the stream a		ondition: Assess	
	ere	Sev	or	Po	y ginal	Conditional Categor	ptimal	Subo	imal	Optir	
	5	1	ed/incised.	Overwidene	ess than Severe or	Often incised, but I	~	1	موليد المحلاب	1	
CI	stability. Severe taking within the d below average ajority of banks agetative protection 1 20% of banks, is on. Obvious bank Erosion/raw banks 0/OR Aggrading han 80% of stream by deposition, tatability. Multiple d/or subterranean w.	incision, flow cont banks. Streambe rooting depth, ms vertical/undercut. Vertical/undercut. Vertical/undercut of present on less than not preventing erosi sloughing present. on 80-100%. ANC channel. Greater the ded is covered contributing to ins thread channels an flow	ority of both banks ossion present on 60- getative protection  6 of banks, and is  in terosion. AND/OR  sam is covered by  Sediment is  ent in nature, and  ability. AND/OR V- have vegetative  nt on > 40% of the  diment deposition is  ent.	Vertically/laterally widen further. Maj are near vertical. Err 80% of banks. Veg present on 20-40% insufficient to prever 60-80% of the stresediment. Stemporary/transie contributing to insta shaped channels protection is preser banks and stable see	wer bank slopes, essent on 40-60% of ive protection on 40-treambanks may rout. AND/OR 40-wered by sediment, emporary/transient, by Deposition that ability, may be ND/OR V-shaped etative protection on s and depositional trribute to stability.	both banks. Vegetati 60% of banks. S bevertical or unde 60% of stream is c Sediment may be t contribute instabili contribute to st forming/present. A channels have vege > 40% of the bank features which cor	ew areas of active cted banks. Majority table (60-80%). Itable (60-80%). AND/OR -80%) AND/OR tures contribute to nkfull and low flow effined. Stream likely inkfull benches, or Ifloodplains along reach. Transient 0-40% of the stream tom.	erosion or unprotec of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are well de has access to ban newly developed portions of the r sediment covers 10- bott	Vegetative surface al rock, prominent/ /OR Stable point ches are present. ginal floodplain or e bankfull benches. and transverse bars diment deposition 10% of bottom.	Very little incision or a 100% stable banks. N protection or natural (80-100%). AND/C bars/bankfull bench Access to their origin fully developed wide Mid-channel bars, an few. Transient sedi covers less than 1	Channel Condition
2.4		1	6	1.	2		.4	2	3	3	Score
		NOTES>>		Po High Poor: Lawns,	ginal  Low Marginal:	gory	areas along the enditional Cate ptimal	Con		Optin	RIPARIAN
			Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	non-maintained area, recently	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water, if present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	anopy cover and a derstory. Wetlands	Tree stratum (dbh > with > 60% tree car non-mainfained unde located within the	Riparian Buffers
			1	Himb	Law	ما ما ال	1				Condition
			Low 0.5	High 0.6	Low 0.75	High 0.85	1.1	High 1.2	.5	1.5	Scores
			0.5	High 0.6  Ensure the of % R	0.75	0.85	1.1	1.2	ach stream bank i	rian areas along eacuare footage for eac	Delineate ripa
			0.5 the sums iparian qual 100	0.6	0.75	0.85	1.1 egories and Cond	1.2 into Condition Cate or estimating leng	ach stream bank in the stream ba	rian areas along eac uare footage for eac iparian Area and Sc	Delineate ripa
			0.5 he sums	0.6  Ensure the of % R	0.75	0.85	1.1 egories and Cond	1.2 into Condition Cate or estimating leng	ach stream bank in the by measuring Score for each rips 100%	rian areas along ear	Delineate ripa
		Cl≕ (Sum % RA * Sc	0.5 the sums iparian qual 100 100%	0.6  Ensure the of % R	0.75	0.85	1.1 egories and Cond	1.2 into Condition Cate or estimating leng	ach stream bank in the property of the propert	rian areas along eac uare footage for eac iparian Area and Sc % Riparian Area>	Delineate ripa Determine squ Enter the % R
CI 1.20	ores*0.01)/2 1.20 1.20	CI≕ (Sum % RA * Sc Rt Bank CI > Lt Bank CI >	0.5 the sums iparian qual 100	0.6  Ensure the of % R	0.75	0.85	1.1 egories and Cond	1.2 into Condition Cate or estimating leng	ach stream bank in the by measuring Score for each rips 100%	rian areas along eac uare footage for eac iparian Area and Sc % Riparian Area>	Delineate ripa Determine squ Enter the % R
	1.20	Rt Bank CI >	0.5 the sums iparian qual 100 100%	0.6  Ensure the of % R  Blocks ed	0.75 the descriptors. ed for you below.	0.85	1.1 egories and Cond th and width. Calc he blocks below.	1.2 into Condition Cate or estimating leng	ach stream bank in the property of the propert	rian areas along ear uare footage for eac iparian Area and Sc % Riparian Area> Score >  % Riparian Area> Score >	Delineate ripa Determine squ Enter the % R Right Bank Left Bank
	1.20	Rt Bank CI >	0.5 the sums iparian qual 100 100%	0.6  Ensure the of % R  Blocks ed	0.75 the descriptors. ed for you below.	0.85	egories and Cond th and width. Calc he blocks below.	1.2 into Condition Cate or estimating leng arian category in the	ach stream bank in the property of the propert	rian areas along ear uare footage for eac iparian Area and Sc % Riparian Area> Score >	Delineate ripa Determine squ Enter the % R Right Bank Left Bank
	1.20	Rt Bank CI >	0.5 the sums iparian qual 100 100% 100%	0.6  Ensure the of % R  Blocks ed	0.75 the descriptors. ed for you below.	0.85	egories and Cond th and width. Calc he blocks below.	1.2 into Condition Cate or estimating leng arian category in the	ach stream bank in the property of the propert	rian areas along ear uare footage for eac iparian Area and Sc % Riparian Area> Score >  % Riparian Area> Score >  1 HABITAT: Varia	Delineate ripa Determine squ Enter the % R Right Bank Left Bank INSTREAN nks; root mats;
	1.20	Rt Bank CI >	0.5 he sums iparian qual 100 100% 100% is shade; undercut listed above are stable. Habitat ally present in less	0.6  Ensure the of % Right Blocks education of the Blo	0.75 the descriptors. ed for you below. stable substrate; I	0.85  ition Scores using culators are provided and leafy debris; al Category Mary Stable habitat eler	1.1 egories and Cond th and width. Calc he blocks below. and depths; woody	1.2  into Condition Cate or estimating leng arian category in the es, water velocity as features.  Subor Stable habitat eler present in 30-50% adequate for n	ach stream bank in the by measuring score for each rips 100% 1.2 1	rian areas along ear uare footage for eac iparian Area and Sc % Riparian Area> Score >  % Riparian Area> Score >  1 HABITAT: Vari; SAV; riffle poole co	Delineate ripa Determine squ Enter the % R Right Bank Left Bank INSTREAN nks; root mats;

	S	Stream Impact Assessment Form Page 2										
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor			
N/A	DC2RVA - Area	05b	VA	R2SB3	02080106	06/09/2016	05STR-B01	500	1			
	ALTERATION: Stream crossin ictions, livestock	ngs, riprap, concre		ncrete blocks, stra	ightening of chanr	nel, channelization	, embankments,	NOTES>>				
	Negligible	Mi	nor		lerate	Sev	vere					
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of by any of the chan in the parameter g	of reach is disrupted nel alterations listed juidelines AND/OR lored with gabion, r cement.					
SCORE	1.5	1.3	1.1	0.9	0.7	١ .	.5					

## REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.32

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

## INSERT PHOTOS:



Top Left: Downstream end of Falling Creek at Highway 1 Bottom Right: Upstream end of Falling Creek at Highway 1

NC DWQ Stream Identification Form Version 4.11 Falling Creek 05-STR-B-01

Date: 06/09/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.803560
Evaluator: L. Eggering, R. Mangum	County: Hanover	Longitude: -77.469274
<b>Total Points:</b> 52 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitter Perennial	Other e.g. Quad Name:

eak Moderate	Strong
1 2	3
2	3
2	3
1 2	(3)
2	3
1 2	3
1 2	(3)
1 2	(3)
5	1.5
5 1	(1.5)
Ye	s = 3
2	3
2	3
0.5	0
5 1	1.5
5	1.5
Ye	s = 3
_	
2) 1	0
2) 1	0
2	3
2	3
5	1.5
5	1.5
5	1.5
5 1	1.5
= 0.75; OBL = 1.5 Other	= 0
7	Zbould.

DC2RVA - Area 05b VA R6 02080106 06/09/2016 1  Name(s) of Evaluator(s) Stream Name and Information  Eggering, R. Mangum 05-STR-B-02  RIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Riparian areas with tree stratum (with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.  Tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and an on-maintained understory. Wetlands areas.  The stratum (dbh > 3 inches) present, with 30% tree canopy cover and an on-maintained understory. Wetlands areas.  The stratum (dbh > 3 inches) present, with 30% tree canopy cover and an on-maintained understory. Wetlands areas.  The stratum (dbh > 3 inches) present, with 30% tree canopy cover and an on-maintained understory.  The stratum (dbh > 3 inches) present, with 30% tree canopy cover and an on-maintained understory.  The stratum (dbh > 3 inches) present, with 30% tree canopy cover and an on-maintained understory.  The stratum (dbh > 3 inches) present, with 30% tree canopy cover and an on-maintained understory.  The stratum (dbh > 3 inches) present, with 30% tree canopy cover and an on-maintained understory.  The stratum (dbh > 3 inches) present, with 30% tree canopy cover and shirtled present. With 30% tree canopy cover and shirtled present. With 30% tree canopy cover and shirtled present. With 30% tree canopy cover under understory.  The stratum (dbh > 3 inches) present, with 30% tree canopy cover under understory.  The stratum (dbh > 3 inches) present, with 30% tree canopy cover under understory.  The stratum (dbh > 3 inches) present, with 30% tree canopy cover under understory.  The stratum (dbh > 3 inches) present understory.  The stratum (dbh > 3 inches) present understory.  The stratum (dbh > 3 inches) present understory.  The stratum (dbh > 3 inches) present understory.  The stratum (dbh > 3 inches) present understory.  The stratum (dbh > 3 inches) present understory	Project Name   Docality   Class   HUC   Date   SAR #   ImpactiSAR   Impact   Factor	Project Name	Project Name				I Stre	fied Stream M	lethodology f					
DCZRVA - Area 05b VA R6 02080106 06/09/2016 1  Name(s) of Evaluator(s)  Stream Name and Information  O5-STR-B-02  RIAN BUFFERS: Assess both banks 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Suboptimal  Normalization Rights and reasonable (Special and reasonable of the stratum (right) > 3 inches) present, with estimation of the entire stratum (right) > 3 inches) present, with soft size a carpoy cover and an areas.  Well-off of the entire stratum (right) > 3 inches) present, with soft size a structure of the entire stratum (right) and reasonable of the entire strat	DC2RVA - Area 05b VA R6 02080106 06/09/2016 100 100 100 100 100 100 100 100 100	DCZRIVA - Area 65b  VA  R6  02080106  060922016  1  1  1  1  1  1  1  1  1  1  1  1	DC2RVA - Area 05b VA R6 02080106 06092/016 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ect #		Project Name	•		Cowardin		Date	SAR#		
RIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal  High Suboptimal  Low Buboptimal  Riparian areas With tree stratum, (bih > 3 inchea) present, liventh areas With tree stratum, on-maintained understory, Westlands areas.  High Low High Low High Low High Low High Low High Low (dense understory)  Recent cutorer (dense understory)  Recent understory (dense understory)  Recent cutorer (dense understory)  Recent cutorer (dense understory)  Recent cutorer (dense understory)  Recent cutorer (dense understory)  Recent cutorer (dense understory)  Recent cutorer (dense understory)  Recent cutorer (dense understory)  Recent cutorer (dense understory)  Recent cutorer (dense understory)  Recent cutorer (dense understory)  Recent cutorer (dense understory)  Recent cutorer (dense understory)  Recent cutorer (dense understory)  Recent cutorer (dense understory)  Recent cutorer (dense understory)  Recent cutorer (dense understory)  Recent cutorer (dense understory)  Recent cut	gering, R. Mangum  AN BUFFERS: Assess both banks 100 lout (ignation areas along the entits SAR, (incup) measurements of length & wilds may be acceptable)  Conditional Category  Optimal  Suboptimal  High Auditorian and Suboptimal  High Auditorian and Suboptimal  High Auditorian and Suboptimal  High Auditorian and Suboptimal  High Auditorian and Suboptimal  High Auditorian and Suboptimal  High Auditorian and Suboptimal  High Auditorian and Suboptimal  High Auditorian and Suboptimal  High Auditorian and Suboptimal  High Auditorian and Suboptimal  High Committee of Suboptimal  High Low High Low High Committee of Suboptimal  High Low High Low High Low High Low  High Low High Low High Low  High	Stream Name and Information  Optimal  Suboptimal  NBUFFERS: Assess both banks 1:00 foot repairs mass along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal  Suboptimal  Into Marginal  Into Ma	pering (Peringuis Conditional Category)  NBUFFERS: Assess both banks, 100 four spartins areas along the erroins SAR. (longth measurements of length & width resy be acceptable)  Conditional Category  Optimal Suboptimal High Suboptimal Warrians along the professional High Suboptimal High Suboptimal Warrians and High Suboptimal High Su	Ά		•						0.11111	length	
Conditional Category  Optimal Suboptimal High Suboptimal Registration areas with tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and contrainting of understory. Westands areas.  In the stratum (dbh > 3 inches) present, with 30% tree canopy cover and contrainting of understory. Westands are asset of the stratum (dbh > 3 inches) present, with 30% to the canopy cover and contrainting of understory. Westands are asset of the stratum (dbh > 3 inches) present, with 30% to the canopy cover and contrainting of understory. Westands are asset of the stratum (dbh > 3 inches) present, with 30% to the canopy cover and contrainting of understory. Westands are asset of the stratum (dbh > 3 inches) present, with 30% tree (anopy cover. which 30% tree (anopy c	AN BUFFERS: Assesse both bank's 100 foot repartian attens along the order SAR. (rough measurements of length & width may be acceptable)    Conditional Category   Workship   Wor	NOTES>> Conditional Category    Water	Conditional Category    Optimal   Subportional   Su							02000100	00/00/2010			
Optimal Suboptimal Category  Suboptimal High Suboptimal: High Suboptimal: Riparian areas with tree stratum ((sh > 3 inches) present, with 5 of 60% tree canopy cover and a non-maintained understory. Wetlands areas.  If The stratum ((sh > 3 inches) present, with 5 of 60% tree canopy cover and a non-maintained understory. Wetlands areas.  If the stratum ((sh > 3 inches) present, with 5 of 60% tree canopy cover and a non-maintained understory. Wetlands areas.  If the stratum ((sh > 3 inches) present, with 5 of 60% tree canopy cover and a non-maintained understory. Wetlands areas.  If the stratum ((sh > 3 inches) present, with 5 of 60% tree canopy cover and a non-maintained understory. Wetlands areas.  If the stratum ((sh > 3 inches) present, with 5 of 60% tree canopy cover and a non-maintained understory. Wetlands areas of the stratum of	Optimal Suboptimal Register areas Well-superior and Cartegory Suboptimal Register areas Superior and Cartegory Suboptimal Register and Cartegory Suboptimal Register and Cartegory Suboptimal Register and Cartegory Suboptimal Register and Cartegory Suboptimal Register and Cartegory Suboptimal Register (Suboptimal Register and Cartegory Suboptimal Register (Suboptimal Register) Suboptimal Register (Su	Conditional Category Suboptimal    High Suboptimal   Poor   Category   Poor   P	Optimal Suboptimal (with 5 Suboptimal (with 5 Suboptimal (street)) (with 5 Suboptimal (street)) (with 6	gge	ering, R. M	angum				05-STI	R-B-02			•
Optimal Suboptimal High Suboptimal High Suboptimal Ripartian areas with tree stratum ((db > 3 inches) present, with 50% tree canopy cover and a non-maintained understory. Weldards areas.  If ree stratum ((db > 3 inches) present, with 50% tree canopy cover and a non-maintained understory. Weldards areas.  If the stratum ((db > 3 inches) present, with 50% tree canopy cover and a non-maintained understory. Weldards areas.  If the stratum ((db > 3 inches) present, with 50% tree canopy cover and a non-maintained understory. Weldards areas.  If the stratum ((db > 3 inches) present, with 50% tree canopy cover and a non-maintained understory. Weldards areas.  If the stratum ((db > 3 inches) present, with 50% tree canopy cover and a network 50% tree canopy cover and a network 50% tree canopy cover and a network 50% tree canopy cover and a network 50% tree canopy cover and a network 50% tree canopy cover and a network 50% tree canopy cover and a network 50% tree canopy cover and a network 50% tree canopy cover and a network 50% tree canopy cover and a network 50% tree canopy cover and 50% tree canopy co	Cyptimal   Suboptimal   Low Suboptimal	Optimal Suboptimal (Low Suboptimal Plant P	Optimal Suboptimal (Low Suboptimal Report of the Company of the Co	RIAN	BUFFERS: /	Assess both bank				gh measurements	of length & width	may be acceptab		
High Suboptimat: Riparian areas with tree stratum; (bh > 3 inches) present, with 3 inches in herbaceous and non-maintained understory. Wetlands areas.  I Tree stratum (dbh > 3 inches) present, with 3 inches in herbaceous and non-maintained understory. Wetlands areas.  I Tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and a non-maintained understory. Wetlands areas.  I Tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and a non-maintained understory. Wetlands areas.  I Tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and a non-maintained understory. Wetlands areas.  I Tree stratum (dbh > 3 inches) present, with 30% tree canopy cover and a non-maintained understory.  I Tree stratum (dbh > 3 inches) present, with 30% tree canopy cover with 40% tree stratum, and a stratum (dbh > 3 inches) present, with 40% tree canopy cover with 40% tree stratum, and a stratum (dbh > 3 inches) present, with 40% tree canopy cover with 40% tree canopy cover with 40% tree stratum, and a stratum (dbh > 3 inches) present, with 40% tree canopy cover with 40% tr	Section   Sect	Section   Condition   Section   Se	Wigh Suboptimals   Wigh Marginal raises   W	1	Opti	imal				ginal	Po	oor	Grassy slop	
n 1.5 1.2 1.1 0.85 0.75 0.6 0.5  riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. esquare footage for each by measuring or estimating length and width. Calculators are provided for you  % Riparian Area and Score for each riparian category in the blocks below.    More   Mo	1.5 1.2 1.1 0.85 0.75 0.6 0.5  partian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  square footage for each by measuring or estimating length and width. Calculators are provided for you  Repairin Area and Score for each riparian category in the blocks below.    Note:   100%	1.5 1.2 1.1 0.85 0.75 0.6 0.5  partian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.   Inquire footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Riparian Area and Score for each riparian category in the blocks below.  Riparian Area and Score for each riparian category in the blocks below.  Score > 1.2   100%	1.5 1.2 1.1 0.85 0.75 0.6 0.5  partian areas along each stream bank into Condition Categories and Condition Scores using the descriptors, square footage for each by measuring or estimating length and width. Calculators are provided for you  Reparan Area and Score for each figurian category in the blocks below.    We Reparan Area and Score for each reparan category in the blocks below.   100%	n v	with > 60% tree can non-maintained und	nopy cover and an derstory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, recently seeded and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		
riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  sequare footage for each by measuring or estimating length and width. Calculators are provided for you  % Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100    Cl= (Sum % RA * Scores*0.01)/2	parian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  square footage for each by measuring or estimating length and width. Calculators are provided for you  k Riparian Area and Score for each riparian category in the blocks below.    Riparian Area and Score for each riparian category in the blocks below.   Riparian Area and Score for each riparian category in the blocks below.   Cie (Sum % RA * Scores*0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Cie (Sum % RA * Scores*0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Cie (Sum % RA * Scores*0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Cie (Sum % RA * Scores*0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Cie (Sum % RA * Scores*0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Cie (Sum % RA * Scores*0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Cie (Sum % RA * Scores*0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Cie (Sum % RA * Scores*0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Cie (Sum % RA * Scores*0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Cie (Sum % RA * Scores*0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Cie (Sum % RA * Scores*0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Cie (Sum % RA * Scores*0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Cie (Sum % RA * Scores*0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Cie (Sum % RA * Scores*0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Cie (Sum % RA * Scores*0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Cie (S	parian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  Apparian Area and Score for each riparian category in the blocks below.    Riparian Area and Score for each riparian category in the blocks below.   Riparian Area and Score for each riparian category in the blocks below.   Riparian Area and Score for each riparian category in the blocks below.   Riparian Area and Score for each riparian category in the blocks below.   Circ (Sum % RA 'Scores'0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Circ (Sum % RA 'Scores'0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Circ (Sum % RA 'Scores'0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Circ (Sum % RA 'Scores'0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Circ (Sum % RA 'Scores'0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Circ (Sum % RA 'Scores'0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Circ (Sum % RA 'Scores'0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Circ (Sum % RA 'Scores'0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Circ (Sum % RA 'Scores'0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Circ (Sum % RA 'Scores'0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Circ (Sum % RA 'Scores'0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Circ (Sum % RA 'Scores'0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Circ (Sum % RA 'Scores'0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Circ (Sum % RA 'Scores'0.01)/2   Riparian Area and Score for each riparian category in the blocks below.   Circ (Sum % RA 'Scores'0.01)/2   Riparian Area and Score for each ripa	parian areas along each stream bank into Condition Categories and Condition Scores using the descriptors, square foolage for each by measuring or estimating length and width. Calculators are provided for you in the locks below.    Riparian Area and Score for each riparian category in the blocks below.   Blocks equal 100	n	4	<u>-</u>	Ť							
Riparian Area and Score for each riparian category in the blocks below.    Riparian Area and Score for each riparian category in the blocks below.	Riparian Area and Score for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Repair and Score for each riparian category in the blocks below.    Score   1.2	Riparian Area and Score for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Repair and Score for each riparian category in the blocks below.    Score   1.2	Riparian Area and Score for each by measuring or estimating length and width. Calculators are provided for you go f % Riparian Repair and Score for each riparian category in the blocks below.    Score > 1.2	ori										
Score > 1.2    Cl= (Sum % RA * Scores*0.01)/2	Score > 1.2    Score > 1.2   Cle (Sum % RA * Scores*0.01)/2     Sk Riparian Areas   100%   100%   Rt Bank Cl > 1.20     Lt Bank Cl > 1.20     Lt Bank Cl > 1.20     REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH     THE REACH CONDITION INDEX (RCI) >>     RCI= (Riparian Cl)/2     COMPENSATION REQUIREMENT (CR) >>     CR = RCI X LF X IF     COMPENSATION REQUIREMENT (CR) >>     CR = RCI X LF X IF	Scote > 1.2    Cl= (Sum % RA * Scores*0.01)22     Scote > 1.2   1.20     Scote > 1.2   1.20     Scote > 1.2   1.20     Lt Bank Cl > 1.20     REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH    THE REACH CONDITION INDEX (RCl) >>     RCl= (Riparian Cl)/2     COMPENSATION REQUIREMENT (CR) >>     CR = RCl x LF x IF	Score > 1.2    Score > 1.2   Clic (Sum % RA * Scores*0.01)/2     Score > 1.2   Lit Bank Cl > 1.20     Lit Bank Cl > 1.20     Lit Bank Cl > 1.20     Lit Bank Cl > 1.20     Lit Bank Cl > 1.20     Lit Bank Cl > 1.20     Lit Bank Cl > 1.20     Lit Bank Cl > 1.20     Compensation Need to 2 decimal places. The CR should be rounded to a whole number.     THE REACH CONDITION INDEX (RCI) >>     RCI= (Riparian Cl)/2     Compensation Requirement (CR) >>     CR = RCI X LF X IF     CR = RCI	ne squa	are footage for ea	ach by measuring	or estimating len	gth and width. Ca		•	of % F	Riparian		
CI= (Sum % RA * Scores*0.01)/2  Ank	Clic (Sum % RA* Scores*0.01)/2	Clic (Sum % RA* Scores*0.01)/2	Score > 1.2   Lt Bank CI > 1.20	Bank 9								100%		
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  is and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  ### RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  #### RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  ###################################	Score > 1.2  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  d RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF									,		
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  Index of the condition of	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  d RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  IOTOS:	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  d RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  HOTOS:	k   -	·							100%		
	HOTOS:	IOTOS:	IOTOS:											
		PROPOSED IMPACT:	PROPOSED IMPACT:	PHOT	IOS:									
F PROPUSED IMPACT:				: PF	ROPOSED IN	MPACT:								

Project/Site: DC2RVA - Area 05

NC DWQ Stream Identification Form Version 4.11

Date: 06/09/2016

05-STR-B-02

Latitude: 37.798879

Weak  1  1  1  1  1  1  1  0.5  0.5	Other e.g. Quad Name:  Moderate  2 2 2 2 2 2 2 2 1 1 Yes =	Strong  3 3 3 3 3 3 3 1.5 1.5
Weak  1  1  1  1  1  1  1  0.5  0.5	e.g. Quad Name:  Moderate 2 2 2 2 2 2 2 2 1 1	3 3 3 3 3 3 3 1.5
Weak  1 1 1 1 1 1 1 1 0.5 0.5	Moderate  2 2 2 2 2 2 2 2 2 1 1 1	3 3 3 3 3 3 3 1.5
1 1 1 1 1 1 1 1 0.5 0.5	2 2 2 2 2 2 2 2 2 1	3 3 3 3 3 3 3 1.5
1 1 1 1 1 1 1 0.5 0.5	2 2 2 2 2 2 2 2 2 1	3 3 3 3 3 3 3 1.5
1 1 1 1 1 1 1 0.5 0.5	2 2 2 2 2 2 2 2 1	3 3 3 3 3 3 1.5 1.5
1 1 1 1 1 0.5 0.5	2 2 2 2 2 2 2 1 1	3 3 3 3 3 1.5 1.5
1 1 1 1 1 0.5 0.5	2 2 2 2 2 2 1 1	3 3 3 3 3 1.5 1.5
1 1 1 1 0.5 0.5	2 2 2 2 2 1	3 3 3 1.5 1.5
1 1 1 0.5 0.5	2 2 2 1 1	3 3 3 1.5 1.5
1 1 0.5 0.5	2 2 1 1	3 3 1.5 1.5
1 0.5 0.5	2 1 1	3 1.5 1.5
0.5 0.5	1	1.5 1.5
0.5	1	1.5
:0	Yes =	
		<del>=</del> 3
	1	
1	2	3
1	2	3
1	0.5	0
0.5	1	1.5
0.5	1	1.5
: 0	Yes =	= 3
	_	
2	1	0
2	1	0
1	2	3
1	2	3
0.5	1	1.5
0.5	1	1.5
0.5	1	1.5
0.5	1	1.5
FACW = 0.75; OF	BL = 1.5 Other = 0	$\overline{}$
segments of the	stream bed. Silta	ation has
//		
1/ /	1.	
	woods	
	(tea)	
	/ -	
	/	
	/	
	0.5 0.5 FACW = 0.75; OE	0.5 1 0.5 1 FACW = 0.75; OBL = 1.5 Other = 0 n segments of the stream bed. Silta

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR **Impact** Project # **Project Name** Locality HUC Date SAR# Class length Factor DC2RVA - Area 05b 02080106 06/09/2016 R6 1 Stream Name and Information Name(s) of Evaluator(s) L. Eggering, R. Mangum 05-STR-B-03 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Braided ephemeral Marginal stream. 22-STR-07 Low Marginal: Non-maintained, High Poor: ow Suboptimal High Suboptima Lawns, mowed High Marginal: Riparian areas ense herbaceou Riparian areas with tree stratum Low Poor: Impervious and maintained vegetation, Non-maintained, areas, nurseries (dbh > 3 inches) ense herbaceou riparian areas (dbh > 3 inches) no-till cropland: surfaces, mine present, with 30% tree canop egetation with acking shrub and Tree stratum (dbh > 3 inches) presen with > 60% tree canopy cover and ar resent, with 30% actively grazed spoil lands, Riparian tree stratum, hay either a shrub to 60% tree pasture, sparsely enuded surface oroduction, ponds open water. If cover and a laver or a tree **Buffers** ntained understory. Wetlands nopy cover and row crops, active maintained layer (dbh > 3 maintained area containing both feed lots, trails, or understory. inches) present. present, tree herbaceous and recently seeded other comparable Recent cutover with <30% tree stratum (dbh >3 shrub layers or a conditions. (dense canopy cover. inches) present non-maintained other comparable with <30% tree vegetation). anopy cover wit maintained understory High Low Hiah High Low Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 100% % Riparian Area> 100% Right Bank 1.2 Cl= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > 1.20 CI Left Bank 1.20 Lt Bank CI > 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number THE REACH CONDITION INDEX (RCI) >> 0.60 RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF

**INSERT PHOTOS:** 



Left: Typical view upstream

Right: Typical view upstream

Project/Site: DC2RVA - Area 05

NC DWQ Stream Identification Form Version 4.11

Date: 06/09/2016

05-STR-B-03

Latitude: 37.795836

	nation (circle one) rmittent Perennial	Other e.g. Quad Name:	
		•	
Absent	Weak	Moderate	Strong
0	1	2	3
0	1	2	3
0	1	2	3
0	1	2	3
0	(1)	2	3
0	1	2	3
0	1	2	3
0	1	2	3
0	0.5	1	1.5
0	0.5	1	1.5
No	0 = 0	Yes =	= 3
	1	2	3
	1		3
	1		0
_	0.5	1	1.5
		1	(1.5)
		Yes =	
3	2		0
3		$\overline{}$	0
0	1	2	3
$\rightarrow$			3
		1	1.5
		1	1.5
$\rightarrow$			1.5
		1	1.5
		L = 1.5 Other = 0	
ls. See p. 35 of manua			
· · · · · · · · · · · · · · · · · · ·		of woods. Tall S	Sweetgum
•			
(no water)	edi	ge of Field	d V
	Absent  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 0 1 0	Absent   Weak   Moderate   0

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR **Impact** Project # **Project Name** Locality HUC Date SAR# Class length Factor N/A DC2RVA - Area 05b VA 02080106 06/09/2016 1 R6 Name(s) of Evaluator(s) **Stream Name and Information** 05-STR-B-04 L. Eggering, R. Mangum 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal 22-STR-08 Suboptimal Marginal Poor Low Marginal: Non-maintained, High Poor: ow Suboptimal High Suboptima Lawns, mowed. Riparian areas **High Marginal:** lense herbaceou Low Poor: Impervious and maintained vith tree stratum vegetation, with tree stratum areas, nurseries (dbh > 3 inches) ense herbaceou riparian areas (dbh > 3 inches) no-till cropland; surfaces, mine present, with 30% tree canop vegetation with either a shrub acking shrub an esent, with 30% to 60% tree Tree stratum (dbh > 3 inches) preser actively grazed Riparian tree stratum, hay with > 60% tree canopy cover and a pasture, sparsely denuded surfaces cover and a layer or a tree layer (dbh > 3 oroduction, ponds open water. If **Buffers** canopy cover and containing both aintained understory. Wetlands vegetated nonrow crops, active maintained areas. maintained area feed lots, trails, o understory. inches) present present, tree herbaceous and shrub layers or a recently seeded other comparable Recent cutover with <30% tree stratum (dbh >3 and stabilized, or conditions. (dense canopy cover. inches) present non-maintained other comparable vegetation). with <30% tree understory. condition. canopy cover wit maintained understory. High Low High Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores 1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below. Blocks equal 100 % Riparian Area> 80% 100% 20% Right Bank Score > 0.85 1.1 CI= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> 100% 100% Rt Bank CI > 0.90 CI Left Bank

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

1.1

THE REACH CONDITION INDEX (RCI) >> 0.50

RCI= (Riparian CI)/2

1.10

1.00

0

COMPENSATION REQUIREMENT (CR) >>

Lt Bank CI >

CR = RCI X LF X IF

**INSERT PHOTOS:** 

Score >



Typical view downstream

Project/Site: DC2RVA - Area 05

NC DWQ Stream Identification Form Version 4.11

Date: 06/09/2016

05-STR-B-04

Latitude: 37.795230

Evaluator: L. Eggering, R. Mangum	County: Hanove	er	Longitude: -77	.480619
<b>Total Points:</b> 16.5 Stream is at least intermittent f ≥ 19 or perennial if ≥ 30*	Stream Determine Ephemeral Inter	nation (circle one) rmittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 10.5	Absent	Weak	Moderate	Strong
I <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	0	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2)	3
6. Depositional bars or benches	0		2	3
7. Recent alluvial deposits	0	(1)	2	3
B. Headcuts	0		2	3
9. Grade control	0	0.5	1	1.5
0. Natural valley	0	0.5	1	1.5
Second or greater order channel	No	0 = 0	Yes :	
artificial ditches are not rated; see discussions in manual				
3. Hydrology (Subtotal = 4.0)				
2. Presence of Baseflow	0	1	2	3
3. Iron oxidizing bacteria	0	1	2	3
4. Leaf litter	1.5	1	0.5	0
5. Sediment on plants or debris	0	0.5	1	1.5
6. Organic debris lines or piles	0	0.5	1	1.5
7. Soil-based evidence of high water table?	No	) = 0	Yes :	
C. Biology (Subtotal = $2.0$ )	L	l .		
18. Fibrous roots in streambed	3	2	(1)	0
9. Rooted upland plants in streambed	3	2		0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish		0.5	1	1.5
23. Crayfish		0.5	1	1.5
24. Amphibians		0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OBI	L = 1.5 Other = 0	_
*perennial streams may also be identified using other metho	ods. See p. 35 of manua			
Notes: Standing water in some sections but othe	=		3	
<u> </u>	· ·	, ,		
Sketch:     April   Part   Par	Gream pine	-0		
		Rbecch on bay	A	Ag
N no flow IV	n stream	0 Y 1 100	na !	n

	Ephe	emera				ment for use in Virg		(Forr	n 1a)		
Project #		Project Name	)	For us	e in ephemeral s Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area		VA	R6	02080106	06/09/2016			1	
	e(s) of Evalua ering, R. M		Stream Nam	e and Inform	ation	05-STI	R-B-05				
2. RIPARIAN	N BUFFERS: /	Assess both bank		ditional Cate	•	gh measurements	of length & width	may be acceptab	NOTES>>		
	Opt	imal		otimal		ginal	Po	oor	22-STR-09		
Riparian Buffers	with > 60% tree ca	derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Condition		_	High	Low	High	Low	High	Low			
Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
Determine squeelow.	arian areas along e uare footage for ea Riparian Area and	ach by measuring	or estimating len	gth and width. Ca		•	of % F	the sums Riparian equal 100			
Right Bank	% Riparian Area>	80%	10%	10%				100%			
	Score >	0.75	1.1	0.85					CI= (Sum % RA * So	cores*0.01)/2	
Left Bank	% Riparian Area>	80%	10%	10%				100%	Rt Bank CI >	0.80	CI
	Score >	0.75	1.1	0.85					Lt Bank CI >	0.80	0.80
MOTE The Observed	201-1					NDITION UN	IIS FOR IH		CONDITION IND	EV (DCI)	0.40
NOTE: The CIS and P	RCI should be rounded	d to 2 decimal places.	The CK should be ro	unded to a whole hun	ilber.				CONDITION IND CI= (Riparian CI)	` '	0.40
									ON REQUIREM	ENT (CR) >>	0
INCERT BUG	T00					-		CR = RCI	X LF X IF		
DESCRIBE E		мраст-									
DESCRIBE F	PROPOSED IN	MPACT:									

Project/Site: DC2RVA - Area 05

NC DWQ Stream Identification Form Version 4.11

Date: 06/09/2016

05-STR-B-05

1.5

1.5

1.5

1.5

1

1

FACW = 0.75; OBL = 1.5 Other = 0

Latitude: 37.794280

Evaluator: L. Eggering, R. Mangum	County: Hanove	r	Longitude: -77	'.483158
<b>Total Points:</b> 10.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	:
A. Geomorphology (Subtotal = 7.0	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 1.0 )				
12. Presence of Baseflow		1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes	= 3
C. Biology (Subtotal = $2.5$				_
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
				1

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Incised streambed but no water flow at data collection point. Standing water in some sections; located between two grass fields. 22-STR-09

0.5

0.5

0.5

0.5

Sketch:

22. Fish 23. Crayfish

25. Algae

24. Amphibians

26. Wetland plants in streambed

	Ephe	mera		fied Stream I	Methodology	ment for use in Virg		(For	m 1a)		
Project #		Project Name	•	Locality	Cowardin	HUC	Date	SAR#	Impact/SAR	Impact	
N/A		2RVA - Area		VA	Class.	02080106	06/20/2016		length	Factor 1	
Nam	e(s) of Evalua		Stream Nam								
L. Egg	jering, R. M	angum				05-81	R-B-06				
2. RIPARIAN	N BUFFERS:										
	Opt	imal		nditional Cate	T	ginal	Pe	oor	NOTES>> 22-STR-14		
Riparian Buffers	Tree stratum (dbh with > 60% tree ca non-maintained un	> 3 inches) present, anopy cover and an iderstory. Wetlands ass.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with	Low Marginal: Non-maintained, dense herbaceous vegetation,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated normaintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Condition	1	.5	1,2	1.1	0.85	0.75	0.6	0.5			
Scores  1. Delineate rips	arian areas along								=		
descriptors.  2. Determine so below.	quare footage for e	each by measurin	g or estimating le	ngth and width.	Calculators are pi		of % I	the sums Riparian			
	Riparian Area and % Riparian Area>	100%	parian category ii	THE DIOCKS DEIO	w.		BIOCKS	100%			
Right Bank	Score >	1.2									
	% Riparian Area>	100%						100%	CI= (Sum % RA * So Rt Bank CI >	1.20	С
Left Bank	Score >	1.2						10070	Lt Bank CI >	1.20	1.2
		REACH C	ONDITION I	NDEX and S	STREAM CO	NDITION UN	ITS FOR TH	IIS REACH	·		
NOTE: The CIs and F	RCI should be rounded	to 2 decimal places.	The CR should be rour	nded to a whole numb	oer.				CONDITION IND	· · ·	0.6
									CI= (Riparian CI) ON REQUIREM		0
									XLFXIF	Litti (Oity PP	
DESCRIBE F	PROPOSED II	MPACT:									i 1

05-STR-B-06 NC DWO Stream Identification Form Version 4.11 Date: 06/20/2016 Project/Site: DC2RVA - Area 05 Latitude: 37,747401 Evaluator: L. Eggering, R. Mangum County: Hanover Longitude: -77.504822 Total Points: 12.75 Stream Determination (circle one) Other Stream is at least intermittent **Ephemeral** Intermittent Perennial e.g. Quad Name: if ≥ 19 or perennial if ≥ 30\* **Absent** Weak Moderate Strong A. Geomorphology (Subtotal = 81<sup>a.</sup> Continuity of channel bed and bank 0 1 2 3 2. Sinuosity of channel along thalweg 0  $\bigcirc$ 2 3 3. In-channel structure: ex. riffle-pool, step-pool, 2 3 0 1 ripple-pool sequence 4. Particle size of stream substrate 0 2 3 1 5. Active/relict floodplain 2 3 0 6. Depositional bars or benches 0 (2)3 7. Recent alluvial deposits 0 1 3 8. Headcuts 0 1 2 3 9. Grade control 0 0.5 1 1.5 10. Natural valley 0 0.5 1 1.5 11. Second or greater order channel No = 0Yes = 3artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 1.512. Presence of Baseflow 2 1 3 0 3 13. Iron oxidizing bacteria 2 1 14. Leaf litter 1.5 1 0.5 0 15. Sediment on plants or debris 0.5 1 1.5 16. Organic debris lines or piles (1.5)0.5 1 17. Soil-based evidence of high water table? No = 0Yes = 3C. Biology (Subtotal = 3.25 18. Fibrous roots in streambed 3 2 0 19. Rooted upland plants in streambed 3 2 0 20. Macrobenthos (note diversity and abundance) 0 3 1 2 0 2 21. Aquatic Mollusks 1 3 22. Fish 0 0.5 1.5 1 23. Crayfish 0 (0.5)1 1.5 24. Amphibians 0 1 1.5 0.5 25. Algae 0.5 1.5 FACW = 0.75; OBL = 1.5 Other = 026. Wetland plants in streambed \*perennial streams may also be identified using other methods. See p. 35 of manual. Notes: Generally dry, braided ephemeral stream channel, 22-STR-14 Sketch:

# Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

	For use in ephemeral streams												
Project #	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor				
N/A	N/A DC2RVA - Area 05b			R6	02080106	06/09/2016			1				
Name	e(s) of Evaluator(s)	Stream Name	e and Informa	ation									

05-STR-B-07

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

				NOTES>>						
	Optimal	Subo	ptimal	Mar	ginal	Po	oor	22-STR-06		
Riparian Buffers	Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
		High	Low	High	Low	High	Low			
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5			
	arian areas along each stream ban	k into Condition C	ategories and Co	ndition Scores us	sing the	Ensure t	the sums			
descriptors.  2. Determine sq below.	uare footage for each by measurin	g or estimating le	ngth and width. (	Calculators are pr	ovided for you	of % F	Riparian			
3. Enter the % F	Riparian Area and Score for each r	iparian category i	n the blocks below	v.		Blocks e	qual 100			
Right Bank	% Riparian Area> 100%						100%			
	Score > 1.1									ļ
	4000						4000/	CI= (Sum % RA * \$	,	
Left Bank	% Riparian Area> 100%						100%	Rt Bank CI >	1.10	
	Score > 1.1							Lt Bank CI >	1.10	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.55 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:

L. Eggering, R. Mangum



NC DWQ Stream Identification Form Version 4.11

05-STR-B-07

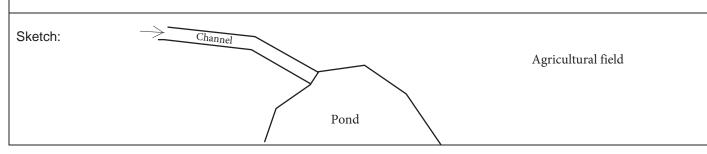
Date: 06/09/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.791246
Evaluator: L. Eggering, R. Mangum	County: Hanover	Longitude: -77.489466
<b>Total Points:</b> 11 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral ntermittent Perennial	Other e.g. Quad Name:

if $\geq 19$ or perennial if $\geq 30^*$	Ephemeral nter	mittent Perennial	e.g. Quad Name:		
A Cooperate halomy (Cylestel 65	Absent	Weak	Moderate	Strong	
A. Geomorphology (Subtotal = $6.5$ )	Absent	vveak		Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	1	2	3	
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	No	= 0	Yes = 3		
<sup>a</sup> artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = $1.5$ )					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	No	= 0	Yes	= 3	
C. Biology (Subtotal = $3.0$					
18. Fibrous roots in streambed	3	2	1	0	

18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other = 0	0)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: This is a short ephemeral channel draining into a farm pond. 22-STR-06



# Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

	For use in ephemeral streams									
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor		
N/A	DC2RVA - Area 05b	VA	R6	02080106	06/09/2016			1		
NI.	No. (1) (F. d. (1))									

Name(s) of Evaluator(s) Stream Name and Information

05-STR-B-08 L. Eggering, R. Mangum

2. RIPARIAN	BUFFERS: Assess both bank	s's 100 foot riparian areas along the	e entire SAR. (rough measuremen	ts of length & width may be accept	able)		
Conditional Category							
	Optimal	Suboptimal	Marginal	Poor	22-ST		

			Con	unional Cale	gory				NO I E 3>>	ı	
	Optir	mal	Subo	ptimal	Mar	ginal	Po	oor	22-STR-05		
Riparian Buffers	Tree stratum (dbh > with > 60% tree can non-maintained undd area	opy cover and an erstory. Wetlands	to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
			High	Low	High	Low	High	Low			I
Condition Scores	1.5	5	1.2	1.1	0.85	0.75	0.6	0.5			
	arian areas along e	ach stream bank	k into Condition C	ategories and Co	ondition Scores us	sing the	Ensure	the sums			
descriptors. 2. Determine so below.	quare footage for ea	ach by measurin	g or estimating le	ngth and width. (	Calculators are pr	ovided for you	of % F	Riparian			
<ol><li>Enter the % F</li></ol>	Riparian Area and S	Score for each ri	parian category in	n the blocks below	v.		Blocks e	qual 100			I
Right Bank	% Riparian Area>	100%						100%			I
Rigiil Dalik	Score >	1.1									J
·-									CI= (Sum % RA * S	Scores*0.01)/2	l
Left Bank	% Riparian Area>	80%	20%					100%	Rt Bank CI >	1.10	l
Leit Dailk	Score >	1.1	0.6						Lt Bank CI >	1.00	ĺ

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

THE REACH CONDITION INDEX (RCI) >> 0.53

RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: Typical view facing downstream from culvert

Top Right: Typical view of stream Bottom Left: Typical view of stream

NC DWQ Stream Identification Form Version 4.11

05-STR-B-08

Date: 06/08/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.785137
Evaluator: L. Eggering, R. Mangum	County: Hanover	Longitude: -77.499772
<b>Total Points:</b> 33.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitter Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 23)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No	0 = 0	Yes	= 3
a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 9)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 1.5				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	11	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other meth				
Notes: Deeply incised stream channel at edge of	of corn; recently logg	ed area north o	f field (unplanted bu	ut based on

## Sketch:

		Stre			sment		_	n 1)			
					lethodology f						
Project #		Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area	05b	VA	R2SB3	02080106	06/09/2016				
	e(s) of Evalua		Stream Name	e and Informa	tion						
L. Egge	ering, R. M	langum				05-81	R-B-09				
. Channel C	condition: Asse	ss the cross-secti	on of the stream a		dition (erosion, agg						
	Opt	imal	Subo	ptimal		ginal	Po	oor	Sev	/ere	
		We have	Slightly incised, fr	ew areas of active		less than Severe or stable than Severe	Vertically/laterally	ned/incised. unstable. Likely to	1	5	
Channel Condition	protection or natur (80-100%). AND bars/bankfull ben Access to their or fully developed wid Mid-channel bars, a	Vegetative surface al rock, prominent b/OR Stable point ches are present. iginal floodplain or le bankfull benches. and transverse bars diment deposition	of banks are si Vegetative protec prominent (60- Depositional feat stability. The bar channels are well do has access to ba newly developed portions of the r sediment covers 10	ted banks. Majority table (60-80%). Itable (60-80%). Ition or natural rock-80%) AND/OR urves contribute to hufull and low flow effined. Stream likely hufull bankfull benches, or floodplains along each. Transient 0-40% of the stream tom.	Erosion may be priboth banks. Vegetail 60% of banks. S bevertical or unde 60% of stream is c Sediment may be t contribute instabili contribute instabili channels have vege > 40% of the bank	western on 40-60% of tive protection on 40 treambanks may rcut. AND/OR 40- overed by sediment. emporary/transient, ty. Deposition that tability, may be NDIO/OR V-shaped stative protection on as and depositional tribute to stability.	are near vertical. E 80% of banks. Ve present on 20-40' insufficient to preve 60-80% of the str sediment. temporary/transi contributing to inst shaped channels protection is prese banks and stable se	jority of both banks crosion present on 60 getative protection % of banks, and is nt erosion. AND/OR eam is covered by Sediment is ent in nature, and ability. AND/OR V-have vegetative ent on > 40% of the diment deposition is ent.	vertical/lateral ir incision, flow co banks. Streamb rooting depth, r vertical/undercut. V present on less the not preventing ero sloughing present. on 80-100%. AN channel. Greater bed is coveree contributing to in thread channels a	(or excavated), stability. Severe ntained within the ed below average najority of banks (egetative protection a 20% of banks, is sion. Obvious bank Erosion/raw banks D/OR Aggrading than 80% of stream d by deposition, istability. Multiple nd/or subterranean low.	
0							4	•			CI
Score	,	3	2	.4		2	1	.6		1	2.0
Riparian Buffers	with > 00 % tree carlopy cover and a		High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands		areas with turn (dbh > ton-maintaine). Won-maintained vegetation, ripal vegetation with a cover and intained ry. Recent (r (dense herbaceous areas lacking sh intained ry. Recent (r (dense herbaceous areas lacking sh intained ratined areas areas vegetation, ripal areas areas vegetation, ripal areas areas vegetation, ripal areas lacking sh vegetation, ripal areas lacking sh vegetation, ripal areas lacking sh vegetation, ripal areas lacking sh vegetation, ripal areas lacking sh vegetation with a vegetation w		nurseries; no-till Impervious surfaces, mine grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable conditions.				
			High	Low	High	Low	High	Low			
Condition Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5	1		
Delineate ripa     Determine squ	arian areas along each stream bank into Condition Categories and Conquare footage for each by measuring or estimating length and width. Ca		th and width. Cal	_		of % F	the sums Riparian				
Right Bank	% Riparian Area>	100%						100%			
	JUJE 2	1.2							CI= (Sum % RA * S	cores*0.01)/2	
Left Bank	% Riparian Area>	100%						100%	Rt Bank CI >	1.20	CI
	Score >	1.2							Lt Bank CI >	1.20	1.20
	M HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut sizes, sav; riffle poole complexes, stable features.  Conditional Category  NOTES>> Several riffle pools/grade characteristics.										
	Habitat/		Subo	ptimal		ginal	Po	oor	observed st	•	
Instream Habitat/ Available Cover	Habitat elements a	re typically present	present in 30-50% of adequate for r	ments are typically of the reach and are maintenance of ations.	present in 10-30%	ments are typically of the reach and are naintenance of ations.	lacking or are u elements are typic	s listed above are nstable. Habitat cally present in less of the reach.			Ci
Habitat/ Available	Habitat elements a	re typically present 10% of the reach.	present in 30-50% adequate for r	of the reach and are maintenance of	present in 10-30% of adequate for no popula	of the reach and are naintenance of	lacking or are u elements are typic than 10% c	nstable. Habitat ally present in less			CI 1.20

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Impact Factor DC2RVA - Area 05b R2SB3 02080106 06/09/2016 05STR-B09 N/A VA 500 1 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, NOTES>> spoil piles, constrictions, livestock **Conditional Category** Moderate Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by any is disrupted by an of the channel Iterations listed in of the channel alterations listed in Less than 20% of the stream reach is 20-40% of the Channel Greater than 80% of reach is disrupted stream reach is the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. disrupted by any of the channel alterations listed in disrupted by any of the channel alterations listed in by any of the channel alterations listed Alteration guidelines. If auidelines. If in the parameter guidelines AND/OR 80% of banks shored with gabion, stream has been stream has been channelized, channelized, the parameter the parameter riprap, or cement. normal stable normal stable guidelines. guidelines. stream meander pattern has not stream meander pattern has not recovered. SCORE 1.5 0.5 1.50 1.3 1.1 0.9 0.7 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.18

0

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

## INSERT PHOTOS:



Top Left: Typical view of stream **Bottom Right: Typical view of stream** 

NC DWQ Stream Identification Form Version 4.11

05-STR-B-09

Date: 06/08/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.788234
Evaluator: L. Eggering, R. Mangum	County: Hanover	Longitude: -77.494309
<b>Total Points:</b> 37 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*	Ephemeral Intermittent Perennial e.g. Quad Name:						
A Goomarphalagy (Subtatal 19	Absent	Weak	Moderate	Strong			
A. Geomorphology (Subtotal = 19 )  1 <sup>a.</sup> Continuity of channel bed and bank	O O	4 VVGaR	2	3			
Sinuosity of channel along thalweg	0	1		3			
, ,	0	l	2	3			
<ol> <li>In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence</li> </ol>	0	1	2	3			
4. Particle size of stream substrate	0	1	2	3			
5. Active/relict floodplain	0	1	2	3			
6. Depositional bars or benches	0	1	2	3			
7. Recent alluvial deposits	0	1	2	3			
8. Headcuts	0	1	2	3			
9. Grade control	0	0.5	1	1.5			
10. Natural valley	0	0.5	1 _	1.5			
11. Second or greater order channel	No	= 0	Yes	= 3			
<sup>a</sup> artificial ditches are not rated; see discussions in manual							
B. Hydrology (Subtotal = $10.5$ )							
12. Presence of Baseflow	0	1	2	3			
13. Iron oxidizing bacteria	0	1	2	3			
14. Leaf litter	1.5	1	0.5	0			
15. Sediment on plants or debris	0	0.5	1	1.5			
16. Organic debris lines or piles	0	0.5	1	(1.5)			
17. Soil-based evidence of high water table?	No	= 0	Yes	= 3			
C. Biology (Subtotal = $\frac{7.5}{}$ )	·						
18. Fibrous roots in streambed	3	2	1	0			
19. Rooted upland plants in streambed	3	2	1	0			
20. Macrobenthos (note diversity and abundance)	0	1	2	3			
21 Aquatic Mollusks		1	2	3			

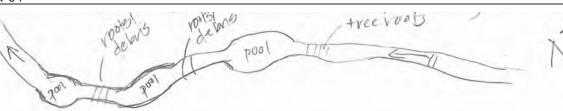
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other = 0	0

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Watermeal/duckweed; concrete headwall with metal pipe on left bank hillside feeds water toward stream.

## 22-STR-04

Sketch:



		Stre	Uni	ified Stream N	/lethodology f	or use in Virg		n 1)			
Project #		Project Name		Locality	Cowardin Class.	HUC	perennial Date	SAR#	Impact/SAR Impac length Factor		
N/A		2RVA - Area		VA	R2SB3	02080106	06/08/2016				
	e(s) of Evalua gering, R. M		Stream Name	e and Informa	tion	05 ST	R-B-10				
	Condition: Asse		ion of the atroom o	and provailing con	dition (oronion og		K-D-10				
i. Chamilei C					Conditional Catego	ry		oor	0	/ere	
		Optimal		few areas of active	Often incised, but Poor. Banks more	less than Severe or stable than Severe	Overwider Vertically/laterally	ned/incised. unstable. Likely to	1	5	
Channel Condition	100% stable banks. protection or natur (80-100%). ANI bars/bankfull ber Access to their or fully developed wid Mid-channel bars, few. Transient se	or active erosion; 80- . Vegetative surface ral rock, prominent J/OR Stable point ches are present. iginal floodplain or le bankfull benches. and transverse bars sdiment deposition in 10% of bottom.	erosion or unproted of banks are sea Vegetative protect prominent (60 Depositional feat stability. The bachannels are well dana access to be newly developed portions of the sediment covers 10	cted banks. Majority stable (60-80%). stable (60-80%). stition or natural rock +80%) AND/OR tures contribute to nkfull and low flow lefined. Stream likely ankfull benches, or af floodplains along reach. Transient 0-40% of the stream tom.	Erosion may be pr both banks. Vegeta 60% of banks. S bevertical or unde 60% of stream is c contribute instabil contribute to s forming/present. channels have veg > 40% of the banl	ower bank slopes, essent on 40-60% of tive protection on 40 (treambanks may rcut. AND/OR 40- overed by sediment, emporary/transient, try. Deposition that tability, may be AND/OR V-shaped teative protection on ss and depositional ntribute to stability.	are near vertical. E 80% of banks. Ve present on 20-40 insufficient to preve 60-80% of the str sediment. temporary/transi contributing to inst shaped channels protection is prese banks and stable se	jority of both banks rosion present on 60 oggetative protection % of banks, and is int erosion. AND/OR eam is covered by Sediment is ent in nature, and ability. AND/OR V-s have vegetative ent on > 40% of the diment deposition is sent.	vertical/lateral ir incision, flow coo banks. Streamb rooting depth, r. vertical/undercut. \( \) present on less that not preventing eros sloughing present. on 80-100%. AN channel. Greater the dis covered contributing to ir thread channels a	(or excavated), stability. Severe tatained within the ed below average najority of banks /egetative protection an 20% of banks, is sion. Obvious bank Erosion/raw banks D/OR Aggrading than 80% of stream 1 by deposition, stability. Multiple nd/or subterranean bw.	C
Score	;	3	2	2.4		2	1	.6		1	1.
2. RIPARIAN	N BUFFERS: A	Assess both bank's	Cor	areas along the e	, ,		f length & width ma	ay be acceptable)	NOTES>>		
						dinai	Po	oor	Logged area to the south; unplanted corn field to the north.		
Riparian Buffers	with > 60% tree conon-maintained un	> 3 inches) present, anopy cover and a derstory. Wetlands ne riparian areas.		3 inches) present, with > 30% tree canopy cover and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh	Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	south; unpl	anted corn	
Buffers	with > 60% tree conon-maintained un	anopy cover and a derstory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30%	Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	south; unpl	anted corn	
•	with > 60% tree c non-maintained un located within th	anopy cover and a derstory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	south; unpl	anted corn	
Condition Scores  1. Delineate ripa 2. Determine squ	with > 60% tree c non-maintained un located within th	anopy cover and a diderstory. Wetlands he riparian areas.	Riparian areas with tree stratum (dbh s in tree stratum (dbh s in tree astratum to the stratum t	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Legories and Condight and width. Call	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure  of % F	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	south; unpl	anted corn	
Condition Scores  Delineate ripa Determine squ	with > 60% tree conon-maintained un located within the located within	anopy cover and a derstory. Wetlands he riparian areas.  .5  each stream bank ach by measuring Score for each rip.	Riparian areas with tree stratum (dbh s in tree stratum (dbh s in tree astratum to the stratum t	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Legories and Condight and width. Call	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure  of % F	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	south; unpl	anted corn	
Condition Scores  1. Delineate ripa 2. Determine squ 3. Enter the % R	with > 60% tree conon-maintained un located within the located within	.5  each stream bank ach by measuring Score for each rip	Riparian areas with tree stratum (dbh s in tree stratum (dbh s in tree astratum to the stratum t	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Legories and Condight and width. Call	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure  of % F	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	south; unpl	anted corn north.	
Condition Scores  Delineate ripa Determine squ B. Enter the % R	with > 60% tree conon-maintained un located within the located within	.5 .5 .ach stream bank ach by measuring Score for each rip 100% 1.1	Riparian areas with tree stratum (dbh s in tree stratum (dbh s in tree astratum to the stratum t	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Legories and Condight and width. Call	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure  of % F	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	south; unplifield to the i	cores*0.01)/2	C
Condition Scores  Delineate ripa Condition Scores  Delineate ripa Condition Scores	with > 60% tree c non-maintained un located within th  1 arian areas along e uare footage for ex Riparian Area and s % Riparian Area> Score >  % Riparian Area> Score >	anopy cover and a defectory. Wetlands he riparian areas.  .5  .5  .ach stream bank ach by measuring Score for each rip  100%  1.1	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cat or estimating lenguarian category in the category	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  tegories and Condition and width. Call the blocks below.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure of % F  Blocks 6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  the sums Riparian equal 100  100%	south; unplifield to the I	anted corn north.	( <u> </u>
Condition Scores  Delineate ripa Determine square Right Bank Left Bank  I. Left Bank  Left Bank	with > 60% tree c non-maintained un located within th  1 arian areas along e uare footage for ex Riparian Area and s % Riparian Area> % Riparian Area>	anopy cover and a dederstory. Wetlands he riparian areas.  15  Each stream bank ach by measuring Score for each rip  100%  1.1  100%  1.1  aried substrate siz	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cat or estimating lenguarian category in the category	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  tegories and Condition and width. Call the blocks below.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure of % F  Blocks 6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  the sums Riparian equal 100  100%	south; unplifield to the I	cores*0.01)/2	
Condition Scores  1. Delineate ripa 2. Determine squ 3. Enter the % R Right Bank Left Bank 3. INSTREAN banks; root mats	with > 60% tree c non-maintained un located within th  1 arian areas along e uare footage for ex Riparian Area and s % Riparian Area> Score >  W Riparian Area> Score >  W HABITAT: Va s; SAV; riffle poole	anopy cover and a defectory. Wetlands he riparian areas.  .5  .5  .ach stream bank ach by measuring Score for each rip  100%  1.1  100%  1.1  aried substrate siz complexes, stable	Riparian areas with tree stratum (dbh 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cat or estimating leng	Riparian areas with tree stratum (dbh s inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  tegories and Condight and width. Call the blocks below.	High Marginal: Non-maintained, dense herbaceous vegetation with > 3 inches) present, with <30% tree canopy cover.  High  0.85  ition Scores using culators are provice y and leafy debris; al Category	Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. led for you below.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure of % F  Blocks 6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  the sums Riparian equal 100  100%	south; unplifield to the I	cores*0.01)/2	
Condition Scores  1. Delineate ripa 2. Determine squ 3. Enter the % R Right Bank Left Bank 3. INSTREAN	with > 60% tree c non-maintained un located within th  arian areas along e uare footage for e:  Riparian Area and s % Riparian Area> Score >  W Riparian Area  Score >  W Riparian Area  Great  Score >  M HABITAT: Va  S SAV; riffle poole  Opt  Habitat elements a	anopy cover and a dederstory. Wetlands he riparian areas.  15  Each stream bank ach by measuring Score for each rip  100%  1.1  100%  1.1  aried substrate siz	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cate or estimating lenguarian category in the category	Riparian areas with tree stratum (dbh si niches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  tegories and Condight and width. Call the blocks below.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  ition Scores using culators are provice culators are provice y and leafy debris; al Category  Stable habitat ele present in 10-30% adequate for r	Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure of % F  Blocks 6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  the sums Riparian equal 100  100%	south; unplifield to the I	cores*0.01)/2	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class Data Point SAR length Project # Impact Factor DC2RVA - Area 05b R2SB3 02080106 06/08/2016 05STR-B10 N/A VA 500 1 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, NOTES>> spoil piles, constrictions, livestock **Conditional Category** Moderate Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by any is disrupted by an of the channel Iterations listed in of the channel alterations listed in Less than 20% of the stream reach is 20-40% of the stream reach is Channel Greater than 80% of reach is disrupted the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. disrupted by any of the channel alterations listed in disrupted by any of the channel alterations listed in by any of the channel alterations listed Alteration guidelines. If auidelines. If in the parameter guidelines AND/OR 80% of banks shored with gabion, stream has been stream has been channelized, channelized, the parameter the parameter riprap, or cement. normal stable normal stable guidelines. guidelines. stream meander pattern has not stream meander pattern has not recovered. SCORE 1.5 0.5 1.50 1.3 1.1 0.9 0.7 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> 0.96 RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF





Top Left: Typical view of stream **Bottom Right: Typical view of stream** 

05-STR-B-10 NC DWO Stream Identification Form Version 4.11

Date: 06/09/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.788793
Evaluator: L. Eggering, R. Mangum	County: Hanover	Longitude: -77.492786
Total Points: 13 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*	Epitemeral inte	innitioni i oronniai	o.g. Quad Mamo		
			•		
A. Geomorphology (Subtotal = $7.5$ )	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	1	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	No	0 = 0	Yes = 3		
<sup>a</sup> artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = $\underline{2.5}$ )					
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	<b>0.5</b>	1	1.5	
17. Soil-based evidence of high water table?	No	0 = 0	Yes = 3		
C. Biology (Subtotal = $3.0$			_		
18. Fibrous roots in streambed	3	2	1	0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	1	2	3	
21. Aquatic Mollusks	0	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0				

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: 22-STR-05

Sketch: NOVSE FIRM

					or use in Virg		ified Stream N	Uni			
	Impact	Impact/SAR	SAR#	perennial Date	HUC	nels classified as	n wadeable chan		Project Name		Project #
	Factor	length	OAK#		02080106	Class. R2SB	VA		C2RVA - Area	D.C	N/A
				06/08/2016	02060106		e and Informa			e(s) of Evalua	
			Creek)	(Falling C	TR-B-11	05-S			. ,	ering, R. M	
			·	Ì	,	, , ,		on of the stream a	ess the cross-secti	ondition: Asse	. Channel C
	ere	Seve	or	Po	ginal	Conditional Categor Mar	ptimal	Subo	Optimal		
	or excavated).	Deeply incised (i	ed/incised.	Overwidene	ess than Severe or	Often incised, but I			" we were		
CI	tability. Severe ained within the d below average ajority of banks getative protection 20% of banks, is on. Obvious bank Erosion/raw banks (OR Aggrading an 80% of stream by deposition, tability. Multiple 4/or subterranean	vertical/lateral ins incision, flow cont incision, flow cont banks. Streamber rooting depth, my vertical/undercut. Ve present on less thar not preventing erosis sloughing present. I on 80-100%. AND channel. Greater the bed is covered a contributing to ins thread channels and flow flow.	ority of both banks osion present on 60- getative protection  % of banks, and is  nt erosion. AND/OR  pam is covered by  Sediment is  ent in nature, and  ability. AND/OR V-  have vegetative  nt on > 40% of the  diment deposition is	Vertically/laterally viden further. Majare near vertical. Err. 80% of banks. Veg present on 20-40% insufficient to prever 60-80% of the stresediment. Stemporary/transie contributing to instashaped channels protection is preser banks and stable secables.	wer bank slopes. sesent on 40-60% of ive protection on 40-treambanks may rout. AND/OR 40-vered by sediment. emporary/fransient, ty. Deposition that ability, may be NND/OR V-shaped stative protection on s and depositional	both banks. Vegetal 60% of banks. S bevertical or unde 60% of stream is co Sediment may be t contribute instabili contribute to si forming/present. A	ew areas of active teted banks. Majority table (60-80%), tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow efined. Stream likely nkfull benches, or if floodplains along reach. Transient 0-40% of the stream tom.	erosion or unproted of banks are sit Vegetative protect prominent (60-Depositional feat stability. The bar channels are well de has access to ba newly developed portions of the 1 sediment covers 10	or active erosion; 80- s. Vegetative surface tral rock, prominent D/OR Stable point nohes are present. riginal floodplain or de bankfull benches. and transverse bars ediment deposition in 10% of bottom.	100% stable banks protection or natu (80-100%). ANI bars/bankfull ber Access to their or fully developed wid Mid-channel bars, few. Transient se	Channel Condition
2.0		1	.6	1.	2	1	.4	2	3		Score
		NOTES>>		length & width ma		gory	nditional Cate	Con			. RIPARIAN
			oor	Po	ginal	iviar	ptimal	Subo	timal	Opi	
			Low Poor: Impervious surfaces, mine spoil lands,		Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both	> 3 inches) present, canopy cover and a nderstory. Wetlands he riparian areas.	with > 60% tree of non-maintained un	Riparian Buffers
			denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	non-maintained area, recently seeded and stabilized, or other comparable condition.	If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	a maintained understory. Recent cutover (dense vegetation).	herbaceous and shrub layers or a non-maintained understory.		located within a	
			row crops, active feed lots, trails, or other comparable conditions.	area, recently seeded and stabilized, or other comparable condition.	If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	understory. Recent cutover (dense vegetation).	herbaceous and shrub layers or a non-maintained understory.			Condition
			row crops, active feed lots, trails, or other comparable conditions.	area, recently seeded and stabilized, or other comparable condition.	If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	or a tree layer (dibh > 3 inches) present, with <30% tree canopy cover.  High  0.85	understory. Recent cutover (dense vegetation).	herbaceous and shrub layers or a non-maintained understory.  High	1.5 each stream bank	1	Scores
			row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	understory. Recent cutover (dense vegetation).  Low 1.1  egories and Condutt and width. Calcutt and width. Calcutt cutover (dense vegetation).	herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cate or estimating lengers.	1.5 each stream bank each by measuring	1 rian areas along o	Scores  Delineate ripa Determine squ
			row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums ciparian qual 100	area, recently seeded and stabilized, or other comparable condition.  High  0.6	If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	understory. Recent cutover (dense vegetation).  Low 1.1  egories and Condutt and width. Calcutt and width. Calcutt cutover (dense vegetation).	herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cate or estimating lengers.	each stream bank each by measuring Score for each rips	1 rian areas along o	Scores  Delineate ripa Determine squ Enter the % R
			row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums Liparian qual 100 100%	area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	understory. Recent cutover (dense vegetation).  Low 1.1  egories and Condutt and width. Calcutt and width. Calcutt cutover (dense vegetation).	herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cate or estimating lengers.	each stream bank each by measuring Score for each rip	fian areas along ourse footage for eliparian Area and	Scores  Delineate ripa Determine squ
CI	,	Cl⊨ (Sum % RA * Sc Rt Bank Cl >	row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums ciparian qual 100 100%	area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	understory. Recent cutover (dense vegetation).  Low 1.1  egories and Condutt and width. Calcutt and width. Calcutt cutover (dense vegetation).	herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cate or estimating lengers.	each stream bank each by measuring Score for each rip.	fian areas along of uare footage for e iparian Area and % Riparian Area>	Scores  Delineate ripa Determine squ Enter the % R Right Bank
CI 1.20	ores*0.01)/2 1.20 1.20	CI= (Sum % RA * So Rt Bank CI > Lt Bank CI >	row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums Liparian qual 100 100%	area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors.	or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	understory. Recent cutover (dense vegetation).  Low 1.1  egories and Condutt and width. Calcutt and width. Calcutt cutover (dense vegetation).	herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cate or estimating lengers.	each stream bank each by measuring Score for each rip.	fian areas along ourse footage for eliparian Area and % Riparian Area>	Scores  Delineate ripa  Determine squ  Enter the % R
	1.20	Rt Bank CI >	row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums ciparian qual 100 100%	area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	or a tree layer (dibh > 3 inches) y 3 inches) present, with <30% tree canopy cover.  High 0.85  Stion Scores using culators are provided and leafy debris;	understory. Recent cutover (dense vegetation).  Low 1.1  egories and Cond th and width. Calc the blocks below.	herbaceous and shrub layers or a non-maintained understory.  High 1.2  into Condition Cate or estimating lenguarian category in the service of the service o	each stream bank each by measuring Score for each rips 100% 1.2	rian areas along e uare footage for e iparian Area and % Riparian Area> Score > % Riparian Area> Score >	Scores  Delineate ripa Determine squ Enter the % R Right Bank Left Bank B. INSTREAM
	1.20	Rt Bank CI >	row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums ciparian qual 100 100%  100%	area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr  of % R  Blocks ed	If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.	or a tree layer (dibh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Ition Scores using culators are provided and leafy debris; all Category	understory. Recent cutover (dense vegetation).  Low 1.1  egories and Cond th and width. Calc the blocks below.	herbaceous and shrub layers or a non-maintained understory.  High 1.2  Into Condition Cate or estimating lenguarian category in the same category in the sam	each stream bank each by measuring Score for each rips 100% 1.2 100% 1.2 aried substrate size	rian areas along of pare footage for e iparian Area and % Riparian Area> Score > % Riparian Area> Score > 1 HABITAT: Va	Scores  Delineate ripa Determine squ Enter the % R Right Bank Left Bank B. INSTREAM
	1.20	Rt Bank CI >	row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums ciparian qual 100 100% 100%  shade; undercut corrected by the corrected corrected by the corrected corrected by the corrected corrected by the corrected corrected by the corrected corrected by the corrected corrected corrected corrected by the corrected corre	area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks etc.	If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  the descriptors. ed for you below.  stable substrate; I	or a tree layer (dish > 3 inches) present, with <30% tree canopy cover.  High 0.85  Ition Scores using culators are provid and leafy debris; al Category Mare Stable habitat elei	understory. Recent cutover (dense vegetation).  Low 1.1  egories and Conduth and width. Calcuth and width. Calcuth and widths. Calcuth and depths; woody Conditiona	herbaceous and shrub layers or a non-maintained understory.  High  1.2  into Condition Cate or estimating lenguarian category in the sease, water velocity at features.  Subo  Stable habitat elepresent in 30-50% adequate for radional shrub and substantial substantial elegres and substantial sub	each stream bank each by measuring Score for each rip: 100% 1.2 100% 1.2 aried substrate siz: complexes, stable	rian areas along e uare footage for e iparian Area and % Riparian Area> Score > % Riparian Area> Score > 1 HABITAT: Va SAV; riffle poole Opt Habitat elements	Scores  Delineate ripa Determine squ Enter the % R Right Bank Left Bank SINSTREAM anks; root mats

#### **Stream Impact Assessment Form Page 2** Applicant Cowardin Class HUC Data Point SAR length Project # Impact Factor DC2RVA - Area 05b 02080106 06/08/2016 05STR-B11 N/A VA R2SB 500 1 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, NOTES>> spoil piles, constrictions, livestock **Conditional Category** Moderate Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by any is disrupted by an of the channel Iterations listed in of the channel alterations listed in Less than 20% of the stream reach is 20-40% of the Channel Greater than 80% of reach is disrupted stream reach is the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. disrupted by any of the channel alterations listed in disrupted by any of the channel alterations listed in by any of the channel alterations listed Alteration guidelines. If auidelines. If in the parameter guidelines AND/OR 80% of banks shored with gabion, stream has been stream has been channelized, channelized, the parameter the parameter riprap, or cement. normal stable normal stable guidelines. guidelines. stream meander pattern has not stream meander pattern has not recovered. SCORE 1.5 0.5 1.50 1.3 1.1 0.9 0.7 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

1.18

0

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: Typical view of stream **Bottom Right: Typical view of stream** 



Project/Site: DC2RVA - Area 05

NC DWQ Stream Identification Form Version 4.11

Date: 06/08/2016

05-STR-B-11

Latitude: 37.778352

FACW = 0.75; OBL = 1.5 Other = 0

Evaluator: L. Eggering, R. Mangum	County: Hanove	er	Longitude: -77.506339		
<b>Total Points:</b> 41 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle one) rmitter Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal = 24)	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
Sinuosity of channel along thalweg	0	1	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	① _	1.5	
11. Second or greater order channel	No	0 = 0	Yes = 3		
<sup>a</sup> artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 10)					
12. Presence of Baseflow	0	4	0		
	0	1	2	3	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	<u>(1)</u>	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
<ul><li>16. Organic debris lines or piles</li><li>17. Soil-based evidence of high water table?</li></ul>	0 No	0.5	1 Yes	1.5	
C. Biology (Subtotal = 7)	INC	) = 0	res	= 3	
18. Fibrous roots in streambed	3	2	1	0	
19. Rooted upland plants in streambed	3	2	<u> </u>	0	
20. Macrobenthos (note diversity and abundance)		1	2	3	
21. Aquatic Mollusks		1	2	3	
22. Fish		0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	

Sketch:

\*perennial streams may also be identified using other methods. See p. 35 of manual. Notes: False nettle is present along the stream bank. 22-STR-02

26. Wetland plants in streambed

					or use in Virg						
	Impact	Impact/SAR	SAR#	perennial Date	HUC	nels classified as Cowardin	n wadeable chan		Project Name		Project #
	Factor	length	OAK#	06/07/2016	02080106	Class. R4SB	VA		C2RVA - Area (		N/A
				00/07/2010	02080106		e and Informa			e(s) of Evaluat	
				R-B-12	05-STI					ering, R. Ma	
								on of the stream a	ess the cross-section	ondition: Asses	Channel C
	ere	Seve	or	Po	ginal	Conditional Categor Marg	ptimal	Subo	timal	Opti	
		Deeply incised (		Overwidenc Vertically/laterally		Often incised, but I Poor. Banks more	ew areas of active		a depart		
CI	ained within the d below average ajority of banks getative protection 120% of banks, is on. Obvious bank Erosion/raw banks by OR Aggrading an 80% of stream by deposition, tability. Multiple d/or subterranean	ventualizatian insincision, flow cont banks. Streamber rooting depth, ma vertical/undercut. Ve present on less than not preventing erosis sloughing present. I on 80-100%. AND channel. Greater th bed is covered I contributing to ins thread channels and flow	ority of both banks osion present on 60- getative protection  % of banks, and is  nt erosion. AND/OR  sam is covered by  Sediment is  ent in nature, and  ability. AND/OR V- have vegetative  nt on > 40% of the  diment deposition is	widen further. Majdare near vertical. Err 80% of banks. Veq present on 20-40% insufficient to prever 60-80% of the stre sediment. Stemporary/transie contributing to insta shaped channels protection is preser banks and stable sec abse	wer bank slopes. sesent on 40-60% of ive protection on 40-treambanks may rout. AND/OR 40-vered by sediment. emporary/fransient, ty. Deposition that ability, may be NND/OR V-shaped stative protection on s and depositional	or Poor due to lo Erosion may be pre both banks. Vegetatt 60% of banks. S bevertical or unde 60% of stream is co Sediment may be t contribute instabili contribute to st forming/present. 4	tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow efined. Stream likely nkfull benches, or floodplains along reach. Transient 0-40% of the stream	of banks are st Vegetative protect prominent (60- Depositional feat stability. The ban channels are well de has access to ban newly developed portions of the r	or active erosion; 80-s. Vegetative surface tral rock, prominent D/OR Stable point nches are present, riginal floodplain or de bankfull benches, and transverse bars ediment deposition in 10% of bottom.	100% stable banks. protection or natura (80-100%). AND, bars/bankfull bend Access to their orig fully developed wide Mid-channel bars, a few. Transient sec	Channel Condition
2.0		1	.6	1.	2	2	.4	2.	3	3	Score
		NOTES>>		length & width ma	measurements of	gory	areas along the enditional Cate	Con	Assess both bank's		. RIPARIAN
			Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	canopy cover and a nderstory. Wetlands		Riparian Buffers
			Low	High	Low	High	Low	High			Condition
			0.5	0.6	0.75	0.85	1.1	1.2	1.5	1.	Scores
				Ensure th	the descriptors.	ition Scores using	egories and Cond		each stream bank i	· ·	. Determine squ
			qual 100	of % R	ed for you below.	culators are provid			Score for each ripa	· I	. Enter the % R
			tiparian	of % R	ed for you below.	culators are provid			Score for each ripa	% Riparian Area>	Right Bank
	ores*0.01)/2	Cl= (Sum % RA * So	qual 100	of % R	ed for you below.	culators are provid			Score for each ripa	· I	
Cl	0.85	Rt Bank CI >	uiparian qual 100 100%	of % R	ed for you below.	culators are provid			Score for each ripa 100% 0.85	% Riparian Area> Score >  % Riparian Area>	
CI 1.03		Rt Bank CI >	qual 100 100%	of % R		v and leafy debris;	ne blocks below.	arian category in the	Score for each ripa 100% 0.85	% Riparian Area> Score >  % Riparian Area> Score >  1 HABITAT: Var	Right Bank  Left Bank  . INSTREAN
	0.85	Rt Bank CI >	qual 100 100% 100% shade; undercut	of % R		and leafy debris;	ne blocks below.	arian category in the state of	Score for each ripa 100% 0.85  100% 1.2  aried substrate size	% Riparian Area> Score >  % Riparian Area> Score >  1 HABITAT: Var SAV; riffle poole o	Right Bank  Left Bank  INSTREAN
	0.85	Rt Bank CI >	qual 100  100%  100%  100%  s shade; undercut  oor  listed above are stable. Habitat ally present in less	of % R Blocks ec	stable substrate; I	and leafy debris; al Category Mare	and depths; woody  Conditiona  ptimal  ments are typically of the reach and are maintenance of	es, water velocity a features.  Subol Stable habitat eler present in 30-50% of	Score for each rips 100% 0.85 100% 1.2 aried substrate size complexes, stable	% Riparian Area> Score >  % Riparian Area> Score >  1 HABITAT: Var SAV; riffle poole c	Right Bank  Left Bank  3. INSTREAN  banks; root mats;

	St	tream In	npact A	ssessm	ent For	m Page	2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	DC2RVA - Area	05b	VA	R4SB	02080106	06/07/2016	05STR-B12	500	1	
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock  Conditional Category										
	Negligible	Mir	nor	Moderate Severe			vere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of by any of the chan in the parameter g	of reach is disrupted nel alterations listed juidelines AND/OR lored with gabion, r cement.			
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.01

0

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Typical view of stream east of wetland

Project/Site: DC2RVA - Area 05

NC DWQ Stream Identification Form Version 4.11

Date: 06/07/2016

### 05-STR-B-12

Latitude: 37.771355

Evaluator: L. Eggering, R. Mangum  Total Points: 19.5  Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		pation (circle one) mittent Perennial	Congitude: -77 Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 10)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	<b>(</b>	1.5
11. Second or greater order channel	No	= 0	Yes :	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $5.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	①	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes :	= 3
C. Biology (Subtotal = 4)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	
*perennial streams may also be identified using other method	ods. See p. 35 of manual			-
Notes: Field Sheet: 22-STR-01.				
Sketch:		//// "	- Treeline	N

Hillslope

Stream

		Stre			Sment Methodology f		-	n 1)			
					netriodology i						
Project #	ı	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area		VA	R2SB3	02080206	06/21/2016				
	e(s) of Evaluat		Stream Name	and Informa		TD D 4	2 /=				
	ering, R. Ma						3 (Falling(	reek)			
1. Channel Co	ondition: Asses	s the cross-secti	on of the stream a		dition (erosion, age Conditional Categor						
	Opti	mal	Subo	ptimal	Marg	ginal	Po	oor	Sev	ere	
	1	AND AND AND AND AND AND AND AND AND AND		ew areas of active	Poor. Banks more	less than Severe or stable than Severe ower bank slopes.	Vertically/laterally	ned/incised. unstable. Likely to jority of both banks	Deeply incised (	(or excavated)	
Channel Condition	Very little incision or 100% stable banks. protection or nature (80-100%). AND/ bars/bankfull ben Access to their orig fully developed wide Mid-channel bars, a few. Transient sed covers less than	Vegetative surface I rock, prominent OR Stable point hes are present. jinal floodplain or bankfull benches. nd transverse bars iment deposition	of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are well do has access to ba newly developed portions of the resediment covers 10	ted banks. Majority table (60-80%). table (60-80%). tion or natural rock 80%). AND/OR ures contribute to hkfull and low flow efined. Stream likely nkfull benches, or floodplains along each. Transient 0-40% of the stream om.	both banks. Vegetat 60% of banks. S bevertical or unde 60% of stream is c Sediment may be t contribute instabili contribute to s' forming/present. A channels have vege	esent on 40-60% of tive protection on 40 interpretation on 40 interpretation on 40 powered by sediment, temporary/transient, ity. Deposition that tability, may be AND/OR V-shaped etative protection on sa and depositional intribute to stability.	80% of banks. Ve present on 20-40' insufficient to preve 60-80% of the str sediment. temporary/transicontributing to inst shaped channels protection is prese.	rosion present on 60 getative protection % of banks, and is not erosion. AND/OR earn is covered by Sediment is ent in nature, and ability. AND/OR V-to have vegetative ent on > 40% of the diment deposition is sent.	vertical/lateral ins incision, flow con banks. Streambe rooting depth, m vertical/undercut. Vi present on less that not preventing erosi sloughing present. on 80-100%. ANIL channel. Greater th	stability. Severe talined within the d below average ajority of banks egetative protection n 20% of banks, is ion. Obvious bank Erosion/raw banks COVGR Aggrading nan 80% of stream by deposition, tability. Multiple d/or subterranean	<u> </u>
Score	3		2	.4		2	1	.6	1		CI 2.4
NOTES>>	-				22-STR-14-I				ı		
Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	3 inches) present, nopy cover and a erstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
			High	Low	High	Low	High	Low	-		
Condition Scores	1.8	5	1.2	1.1	0.85	0.75	0.6	0.5	1		
Delineate ripar     Determine squ     Enter the % Ri	rian areas along ea uare footage for ea iparian Area and S % Riparian Area>	ch by measuring	or estimating leng	th and width. Cal	ŭ	·	of % F	Riparian equal 100			
Right Bank	Score >	1.2									
	9/ Pingries Arri	4000/						4000/	CI= (Sum % RA * So		۲.
Left Bank	% Riparian Area> Score >	1.2						100%	Rt Bank CI >	1.20	1.20
INSTREAM	I HABITAT: Var SAV; riffle poole c	ied substrate size				stable substrate;	low embededness	; shade; undercut	NOTES>>		
				Condition	al Category	ain al	Po	oor			
banks; root mats;	Onti	mal	Subo	ptimal	adequate for maintenance of elements are typically present in less						
	Opti Habitat elements ar in greater than 50	e typically present	Stable habitat eler present in 30-50% of adequate for r	ptimal ments are typically of the reach and are naintenance of ations.	Stable habitat eler present in 10-30% of adequate for n	ments are typically of the reach and are	Habitat elements lacking or are u elements are typic	nstable. Habitat			CI

	St	tream In	npact A	ssessm	ent For	m Page	2								
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor						
N/A	DC2RVA - Area	05b	VA	R2SB3	02080206	06/21/2016	05STR-B13	500	1						
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock  Riprap added at															
Conditional Category culverts. Chan															
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel		60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	by any of the chang in the parameter of	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.	deepens at opening.	cuivert						
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5								
	REACH (	CONDITION	NDEX and S	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH											

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.28 RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0 CR = RCI X LF X IF

INSERT PHOTOS:





Top Left: Ditches along Bluntd Bridge Road, north of Falling Creek Top Right: Culvert under Blunts Bridge Road Bottom Left: Downstream of Blunts Bridge Road

NC DWQ Stream Identification Form Version 4.11 Falling Creek 05-STR-B-13

Date: 06/21/2016	Project/Site: DC2RVA - Area 05	Latitude: 37.789605
Evaluator: L. Eggering, R. Mangum	County: Hanover	Longitude: -77.486355
<b>Total Points:</b> $45.5$ Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 25)	Absent	Weak	Moderate	Strong
a. Continuity of channel bed and bank	0	1	2	3
. Sinuosity of channel along thalweg	0	1	2	3
. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
. Particle size of stream substrate	0	1	(2)	3
. Active/relict floodplain	0	1	(2)	3
. Depositional bars or benches	0	1	(2)	3
. Recent alluvial deposits	0	1	(2)	3
. Headcuts	0	1	2	(3)
. Grade control	0	0.5	(1)	1.5
0. Natural valley	0	0.5	(1)	1.5
Second or greater order channel	No	0 = 0	Yes	= 3
artificial ditches are not rated; see discussions in manual	<b>"</b>			
3. Hydrology (Subtotal = 13				
2. Presence of Baseflow	0	1	2	3
3. Iron oxidizing bacteria	0	1	2	3
4. Leaf litter	1.5	1	0.5	0
5. Sediment on plants or debris	0	0.5	1	1.5
6. Organic debris lines or piles	0	0.5	0_	1.5
7. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
C. Biology (Subtotal = <u>7.5</u> )	_			
8. Fibrous roots in streambed	3	2	1	0
9. Rooted upland plants in streambed	3	2	1	0
Macrobenthos (note diversity and abundance)	0	1	2	3
1. Aquatic Mollusks	0	1	2	3
2. Fish	0	0.5	1	1.5
3. Crayfish	0	0.5	1	1.5
4. Amphibians	0	0.5	1	1.5
5. Algae	0	0.5	1	1.5
6. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method	ds. See p. 35 of manua	ıl.		
lotes: Twin 48" corrugated metal pipe culverts ur	nder Blunts Bridge	Rd. Sharp ben	d in channel downs	tream of
culverts. 22-STR-14-Falling Creek	<u> </u>	•		

		Stre			Sment Methodology f		-	n 1)			
					nels classified as				Impost/SAD	lmnaat	
Project #		Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	05b	VA	R4SB	02080206	06/20/2016				
	e(s) of Evalua	• •	Stream Name	e and Informa	tion	OF CT	R-B-14				
	ering, R. M		• • • • •				K-D-14				
. Channel C	ondition: Asse	ss the cross-secti	on of the stream a		dition (erosion, age Conditional Categor	у					
	Opt	imal	Subo	ptimal	Marg	ginal	Po	oor	Sev	rere	
	"	Who have a second	T.	S		less than Severe or stable than Severe	Overwider Vertically/laterally	ned/incised. unstable. Likely to	1	5	
Channel Condition	100% stable banks. protection or natur (80-100%). AND bars/bankfull ben Access to their or	r active erosion; 80- Vegetative surface al rock, prominent b/OR Stable point ches are present. iginal floodplain or e bankfull benches.	erosion or unproted of banks are s Vegetative proted prominent (60 Depositional feat stability. The bar channels are well d	ew areas of active teed banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow efined. Stream likely nkfull benches, or	or Poor due to lo Erosion may be pro both banks. Vegetal 60% of banks. S bevertical or unde 60% of stream is co Sediment may be t contribute instabili		widen further. Ma are near vertical. E 80% of banks. Ve present on 20-40 insufficient to preve 60-80% of the str sediment. temporary/transi	jority of both banks rosion present on 60 getative protection % of banks, and is int erosion. AND/OR earn is covered by Sediment is ent in nature, and ability. AND/OR V-	vertical/lateral mincision, flow corbanks. Streamberoting depth, mvertical/undercut. Vpresent on less that not preventing eros	stability. Severe ntained within the ed below average najority of banks egetative protection in 20% of banks, is sion. Obvious bank	
	Mid-channel bars, a few. Transient se covers less than	and transverse bars diment deposition a 10% of bottom.	newly developed portions of the r sediment covers 10 bot	floodplains along reach. Transient 0-40% of the stream tom.	forming/present. A channels have vege > 40% of the bank features which con	AND/OR V-shaped etative protection on and depositional attribute to stability.	shaped channels protection is prese banks and stable se abs	s have vegetative ent on > 40% of the diment deposition is ent.	on 80-100%. ANI	stability. Multiple nd/or subterranean	CI
Score	;	3	2	.4	:	2	1	.6	1	1	2.0
Riparian Buffers	Tree stratum (dbh:	anopy cover and a derstory. Wetlands	High Suboptimal:	3 inches) present, with > 30% tree canopy cover and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh	Low Marginal: Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
			High	Low	High	Low	High	Low	-		
Condition Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
. Delineate ripar	_	ach by measuring	or estimating leng	th and width. Cal	lition Scores using culators are provid	·	of % F	the sums Riparian			
Right Bank	% Riparian Area>	100%						100%			
g.n Dalik	Score >	1.2							CI= (Sum % RA * S	cores*0.01\/2	
	% Riparian Area>	100%						100%	Rt Bank CI >	1.20	CI
Loft Book	Score >	1.2							Lt Bank CI >	1.20	1.20
Left Bank			oc water velocity	and depths; woody	y and leafy debris;	stable substrate;	low embededness	; shade; undercut	NOTES>>		
3. INSTREAM											
3. INSTREAM banks; root mats;	; SAV; riffle poole		features.	Condition:	al Category Mar	ginal	Po	oor			
3. INSTREAM banks; root mats;	; SAV; riffle poole (	imal  re typically present	Subo Stable habitat ele present in 30-50% adequate for r		Mar	ments are typically of the reach and are naintenance of	Habitat elements lacking or are u elements are typic	s listed above are nstable. Habitat ally present in less of the reach.			CI

	St	tream In	npact A	ssessm	ent For	m Page	2				
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor		
N/A	DC2RVA - Area	05b	VA	R4SB	02080206	06/20/2016	05STR-B14	500	1		
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock  Conditional Category											
	Negligible Minor Moderate Severe										
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel		60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	by any of the chanr in the parameter g	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.				
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5				
	DEACH	CONDITION	NDEV and C	TDEAM COL	IDITION LINI	TO FOR THE	CDEACH		•		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.18

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF



Top Left: 22-STR-12, facing downstream. Top Right: 22-STR-12, facing upstream. Bottom Left: End of 22-STR-12.

Project/Site: DC2RVA - Area 05

NC DWQ Stream Identification Form Version 4.11

Date: 06/20/2016

05-STR-B-14

Latitude: 37.343129

Evaluator: L. Eggering, R. Mangum	County: Hanove	r	Longitude:	
Total Points: 25	Stream Determin	nation (circle one)	Other	
Stream is at least intermittent		mittent Perennial	e.g. Quad Name:	
if ≥ 19 or perennial if ≥ 30*	Epitemeral inter	mitterit i creminar	c.g. Quad Marrie	1
A Coomerphology (Subtetal 13.0	Absent	Weak	Moderate	Strong
A. Geomorphology (Subtotal = 13.0 )  1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence	-			
4. Particle size of stream substrate	0	0	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0		2	3
8. Headcuts	0		2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $7.0$				ı
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes:	= 3
C. Biology (Subtotal = $5.0$				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	
*perennial streams may also be identified using other method				
Notes: Standing water, very little flow. Coordinate	es on the field shee	t are incorrect: 37.0	343129, -77.503	644. Field
Sheet: 22-STR-12.				
Sketch:		K 11.	// .	
		hommick	/	1 1
	//	NWW		X //

Project # Project Mane   Locality   County   HUC Glass.   Management			Stre	Uni	fied Stream N	lethodology f	or use in Virg		n 1)			
Name(s) of Evaluator(s) L. Eggering, R. Mangum  O5-STR-B-15    Channel Condition: Assess the cross-action of the stream and information	Project #		Project Name			Cowardin			SAR#		-	
L. Eggering, R. Mangum  Optimal  Optimal  Suboptimal  Optimal  Suboptimal  Optimal  Suboptimal  Optimal						02080206	06/20/2016					
Channel Channel Channel Channel Channel Channel Condition Supply integer for some of control of the stream and prevailing condition (creation as particular and control of the control of				Stream Name	e and Informa	tion	05-ST	R-R-15				
Channel Channe				ion of the stream a	and prevailing con-	dition (erosion, ag		10				
Channel Condition Viginity indicated and processes and access control of the cont		Opti	mal	Subo		· · · · · · ·		Po	oor	Sev	ere	
Score 3 2.4 2 1.6 1  NOTES>>  RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Suboptimal Suboptimal Right Right Suboptimal Right Right Suboptimal Right Suboptimal Right Right Suboptimal Right Right Suboptimal Right Right Suboptimal Right Right Suboptimal Right Right Suboptimal Right Right Right Suboptimal Right Ri		100% stable banks. protection or natura (80-100%). AND bars/bankfull ben- Access to their ori- fully developed wide Mid-channel bars, a few. Transient sec	Vegetative surface al rock, prominent /OR Stable point ches are present. ginal floodplain or e bankfull benches. und transverse bars diment deposition	erosion or unproted of banks are sit Vegetative protector prominent (60-Depositional feat stability. The bar channels are well dispersional part of the sediment covers 10 sediment cove	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR rures contribute to hkfull and low flow effined. Stream likely nkfull benches, or floodplains along reach. Transient -3-40% of the stream	Poor. Banks more or Poor due to k Erosion may be pr both banks. Vegeta 60% of banks. S bevertical or unde 60% of stream is c Sediment may be a contribute instabilic contribute to s forming/present. channels have veg. > 40% of the banks.	stable than Severe were bank slopes. Beant on 40-60% of tive protection on 40 tive protection on 40 treambanks may recut. AND/OR 40-overed by sediment. temporary/transient, tity. Deposition that tability, may be AND/OR V-shaped tettive protection on so and depositional	Vertically/laterally widen further. Ma are near vertical. E 80% of banks. Ve present on 20-40 insufficient to preve 60-80% of the str sediment. I temporary/transi contributing to inst shaped channels protection is prese	unstable. Likely to jority of both banks rosion present on 60 getative protection % of banks, and is nt erosion. AND/OR eam is covered by Sediment is ent in nature, and ability. AND/OR V-s have vegetative nt on > 40% of the diment deposition is	vertical/lateral in incision, flow combanks. Streambe rooting depth, m vertical/undercut. V present on less than ot preventing eros sloughing present. on 80-100%. ANI channel. Greater the dis covered contributing to in	stability. Severe tained within the do below average lajority of banks egetative protection 20% of banks, is ion. Obvious banks Erosion/raw banks D/OR Aggrading han 80% of stream by deposition, stability. Multiple	
22-STR-13  22-STR-13		flow.										
Conditional Category    Coptimal   Suboptimal   Calegory   Capital   Calegory   Capital   Calegory   Capital   Calegory   Capital   Calegory   Capital   Calegory   Capital   Calegory   Capital   Calegory   Capital   Calegory   Capital   Calegory   Capital	Score	3	3	2	.4	ı		1	.6	1		
Condition Scores  1.5  1.2  1.1  0.85  0.75  0.6  0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank    % Riparian Area   100%   100%   100%     Score > 1.2	•	with > 60% tree ca	anopy cover and a derstory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30%	Non-maintained, dense herbaceous vegetation, ripariar areas lacking shrut and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  3. Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank    Kiparian Area   100%   100%   100%	Condition			High	Low	High	Low	High	Low			
Score > 1.2 Lt Bank Cl > 1.20  B. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut NOTES>>  Instream Habitat/ Available Cover  Optimal Suboptimal Marginal Poor  Habitat elements are typically present in 90-50% of the reach.  Stable habitat elements are typically present in greater than 50% of the reach.  Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.  Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.  Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	. Delineate ripa 2. Determine squ 3. Enter the % R	rian areas along eau uare footage for ea iparian Area and S % Riparian Area>	ach stream bank ich by measuring score for each rip:	into Condition Cate	egories and Cond	lition Scores using	the descriptors.	Ensure to	the sums Riparian	CI= (Sum % RA * Si	cores*0.01)/2	
3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut panks; root mats; SAV; riffle poole complexes, stable features.    Conditional Category	Left Bank	·							100%	Rt Bank Cl >	1.20	
Instream Habitat/ Available Cover    Available Cover   Available Cover   Ingreater than 50% of the reach.   Ingreater than 50% of the reach and are adequate for maintenance of populations.   Ingreater than 50% of the reach and are adequate for maintenance of populations.   Ingreater than 50% of the reach and are adequate for maintenance of populations.   Ingreater than 50% of the reach and are adequate for maintenance of populations.   Ingreater than 50% of the reach and are adequate for maintenance of populations.   Ingreater than 50%					. 1 1		and the state of				1.20	
Score 1.5 1.2 0.9 0.5	anks; root mats;	SAV; riffle poole o	mal re typically present	Subo Stable habitat elepresent in 30-50% of	Conditional ptimal ments are typically of the reach and are	Stable habitat ele present in 10-30% adequate for r	ginal ments are typically of the reach and are maintenance of	Habitat elements lacking or are u elements are typic	s listed above are nstable. Habitat ally present in less	AUTEO>>		
	Available	in greater than 50% of the reach. adequate for maintenance of adequate for maintenance of elements are typically present in less										

	S	tream Ir	npact A	ssessm	ent For	m Page	2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	DC2RVA - Area	05b	VA	R2SB	02080206	06/20/2016	05STR-B15	500	1
	ALTERATION: Stream crossin rictions, livestock	ngs, riprap, concre		ncrete blocks, strai	ightening of chanr	nel, channelization	, embankments,	NOTES>>	
	Negligible	Mi	nor		erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of by any of the chan in the parameter g	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH (	CONDITION	INDEX and S	TREAM CON	NDITION UNI	ITS FOR THI	S REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 1.18

0

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: Typical view upstream Bottom Right: Typical view downstream

Project/Site: DC2RVA - Area 05

NC DWQ Stream Identification Form Version 4.11

Notes: Frogs present along stream bank. 22-STR-13

cobbles

Sketch:

Date: 06/20/2016

05-STR-B-15

Latitude: 37.737046

Wetland 1

Evaluator: L. Eggering, R. Mangum	County: Hanove	er	Longitude: -77	7.500594
<b>Total Points:</b> 30 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determine Ephemeral Inter			
A. Geomorphology (Subtotal = 14.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	1	2)	3
3. In-channel structure: ex. riffle-pool, step-pool,	-			
ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No	=0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $9.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	0	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes:	= 3
C. Biology (Subtotal = 6.0				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	(1.5)
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other met	hods. See p. 35 of manual	<u> </u>		

Wetland

	Project Name		Uni	fied Stream M	lethodology f	or use in Virg	ginia	III I <i>)</i>			
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	06	VA	R2SB	02080206	3/7/2016		length	1 dotor	
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
	D. Mitchell					06-S	ΓR-01				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal	onditional Catego	<sub>ry</sub> ginal	Po	or	Sev	ere	
	1	W AND	Often incised, but less than Seve			Overwiden		1	5		
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or full) bankfull benches. and transverse ba	/ery little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide anakfull benches. Mid-channel bars, and transverse bars few. Transient perfection of the protection of the pr		ew areas of active toted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, of floodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe were bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	Deeply incised vertical/lateral ininicision, flow con banks. Streambe rooting depth, m vertical/lunderc protection present o banks, is not pre Obvious bank slt Erosion/raw ban AND/OR Aggradin	stability. Severe tained within the do below average ajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%.	
		ediment deposition covers less than 10% of bottom.		rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have on on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depos	ks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	c
Score	3	3	2	.4		2	1.	6	1		2.
DIDADIA	BUFFERS: Assess both bank's 100 foot riparian are										
2. RIPARIAI		Assess both bank	Con	an areas along the	gory	ugh measuremen	ts of length & wid		table)		
2. RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con	ditional Cate	gory						
Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cr. non-maintained un	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %	Tree stratum (dbh: with > 60% tree conon-maintained un located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100		cores*0.01)/2	
Condition Scores  Delineate rip descriptors. Delow. Enter the % Right Bank	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  100%  1.2	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	1.20	С
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  M Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.2  100% 1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si		
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the %  Right Bank  Left Bank  3. INSTREAl undercut banks;	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.2  100% 1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provinced to the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.20	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.2  100% 1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicate the control of the cont	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hap production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.20	
Condition Scores  Delineate rip descriptors. Enter the % Right Bank  Left Bank  Left Bank  INSTREAl undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree conon-maintained un located within th  1.  arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Core >  W HABITAT: W root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 100% 1.2  100% 1.2  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically % of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks ended to the blocks ended	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.20	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi. root mats; SAV; r  Opti Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 100% 1.2  100% 1.2  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below ty and depths; wo res.  Conditional ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to f % R Blocks end	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.20	C 1.2

	St	ream In	npact A	ssessm	ent For	m Pag	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02080206	3/7/2016	06-STR-01		
	L ALTERATION: Stream cross poil piles, constrictions, livestock	sings, riprap, conc	rete, gabions, or		straightening of ch	nannel, channeliz	ration,	NOTES>>	
	Negligible	Mir	nor	Mod	erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	disrupted by an alterations listed guidelines AND/0	in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5	1	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: Veiw of side channel in wetland

Top Right: View of culvert carrying stream under the railroad Bottom Left: Typical view of stream, facign downstream Bottom Right: Stream branching outside the project area

Project/Site: DC2RVA - Area 06

NC DWQ Stream Identification Form Version 4.11

Date: 3/7/2016

06-STR-01

**Latitude:** 37.675190

Total Points: 33.5  Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle on rmittent Perenn		:
A. Geomorphology (Subtotal = 16.5)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	<u>(1)</u>	2	3
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual	<u>.</u>			
B. Hydrology (Subtotal = $8.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
C. Biology (Subtotal = $8.5$				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5		1.5
25. Algae		0.5		1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other med	thods. See p. 35 of manua	ıl.		
Notes: Field Sheet: 14-A-STRM-01.				

	Project Name		Unit	fied Stream M	lethodology f	for use in Virg	ginia	m 1)					
Project #		Project Name		Locality	nels classified a Cowardin Class.	HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor			
N/A	DC	C2RVA - Area	06	VA	R2SB	02080206	3/7/2016		lengui	1 actor			
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation								
	D. Mitchell					06-S	ΓR-02						
I. Channel C	Condition: Asse	ess the cross-sec	tion of the stream										
	Opt	imal	Subo	ptimal	onditional Catego	ginal	Po	or	Sev	ere			
	1	WAR OF THE PERSON OF THE PERSO	Often incised, but less tha			Overwiden		1	5				
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches, and transverse ba	rely little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide ankfull benches. Mid-channel bars, and transverse bars few. Transient cetting of developed the protection of the protection of the protection.		ery little incision or active erosion; 80, 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide ankfull benches. Mid-channel bars, and transverse bars few. Transient		ew areas of active ted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, di floodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe ower bank slopes. resent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sisent, contribute to torming/present.	widen further. Maj	ority of both banks frosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. orary/transient in puting to instability.	Deeply incised vertical/lateral ininicision, flow con banks. Streambe rooting depth, m vertical/lunderc protection present c banks, is not pre Obvious bank slt Erosion/raw ban AND/OR Aggradin	stability. Severe tained within the de below average hajority of banks ut. Vegetative on less than 20% of venting erosion. Doughing present. ks on 80-100%.	
		ediment deposition covers less than 10% of bottom.		rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depor	nks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by outing to instability. channels and/or	С		
Score	3	3	2	4	:	2	1.	6	1	l	2.		
PIDADIAI	N BUFFERS	BUFFERS: Assess both bank's 100 foot riparian are		on areas along the	ontiro SAP (ros	ugh magguraman	to of longth & wid	th may be accor	table)				
2. RIPARIAI		Assess both bank	Con	an areas along the ditional Cate ptimal	gory	ugh measuremen	ts of length & wid		notes>>				
2. RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate	gory	Ginal  Low Marginal:  Non-maintained, dense herbaceous vegetation,							
Riparian Buffers	Opti Tree stratum (dbh ; with > 60% tree cr. non-maintained un	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ir iparian areas lacking shrub and tree stratum, hor production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable					
Riparian	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or of other comparable conditions.					
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5					
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5					
Riparian Buffers  Condition Scores  Delineate rip descriptors. Delineate rip descriptors. Enter the %	Tree stratum (dbh: with > 60% tree cr non-maintained un located within th  1. arian areas along quare footage for e	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5 he sums iparian qual 100		cores*0.01)/2			
Riparian Buffers  Condition Scores  Delineate rip descriptors. Delineate rip descriptors. Enter the %	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  100%  1.2	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5 he sums iparian qual 100	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	1.20	CI		
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree cc non-maintained un- located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  M Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.2  100% 1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * Si				
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % Right Bank  Left Bank  Jundercut banks,	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.2  100% 1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provinced to the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.20			
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 100% 1.2  100% 1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  parian category in  zes, water velocit exes, stable featur  Subo	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicate the control of the cont	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, injarian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the covided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.20			
Condition Scores  Delineate rip descriptors. Left Bank  Left Bank  Left Bank  INSTREAl undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree conon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 100% 1.2  100% 1.2  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo  Stable habitat elpresent in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the rovided for you  bris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % Reserved Blocks estable Blocks	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.20			
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi; root mats; SAV; r  Opti Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 100% 1.2  100% 1.2  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in  zes, water velocit exes, stable featur  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below ty and depths; wo res.  Conditional ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the rovided for you  bris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  he sums iparian qual 100  100%  100%  Iness; shade;	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.20	C( 1.2		

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	csx		VA	R2SB	02080206	3/7/2016	06-STR-02		
	ALTERATION: Stream cross poil piles, constrictions, livestock		Conditiona	l Category				NOTES>>	
	Negligible	Mi	nor	Mod	erate	Sev	ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed	y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5	1	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

**INSERT PHOTOS:** 



Top Left: Typical view of stream Bottom Right: View of culvert carrying stream under the railroad



Project/Site: DC2RVA - Area 06

NC DWQ Stream Identification Form Version 4.11

Date: 3/7/2016

06-STR-02

Latitude: 37.667001

Evaluator: D. Mitchell	County: Henrico	County	Longitude: -77	7.504941
<b>Total Points:</b> 34.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determine Ephemeral Inte			
A. Geomorphology (Subtotal = 17.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $8.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	<u> </u>	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes :	= 3
C. Biology (Subtotal = $8.5$ )		_		
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	11	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other met	thods. See p. 35 of manua	l.		
Notes: Field Sheet: 14-A-STRM-02.				
Sketch: N	FLOW	>		

culvert

		Stre	Uni	fied Stream N	lethodology f	Form	ginia	m 1)					
Project #		Project Name		Locality	cowardin Class.	HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor			
N/A	DC	2RVA - Area	06	VA	R2SB	02080206	3/8/2016		longin	1 dotor			
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation								
L. Egg	jering & D. N	litchell				06-S	ΓR-03						
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream										
	Opt	imal	Subo	ptimal	Conditional Catego Mar	ginal	Po	or	Sev	ere			
	1	AND STATES	1		Often incised, but less than Severe or		Overwiden		1	5			
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars are present. Acce floodplain or fully bankfull benches.	ry little incision or active erosion; 80- 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR stable point bars/bankfull benches re present. Access to their original floodplain or fully developed wide inkfull benches. Mid-channel bars of transverse bars few. Transient diment deposition covers less than		/ery little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient configured the protection or prominent the reaching of the protection of t		tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow Il defined. Stream o bankfull benches, d floodplains along	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	estable than Severe over bank slopes. resent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- m is covered by diment may be usient, contribute to the size of the tarrier of the tarrier of the tarrier of the tarrier of the tarrier of the tarrier of the tarrier of the tarrier of the tarrier of the tarrier of tarrier	widen further. Maj are near vertical. I 60-80% of ban protection prese banks, and is insu erosion. AND/O stream is cover	ority of both banks Frosion present on ks. Vegetative nt on 20-40% of ifficient to prevent R 60-80% of the ed by sediment. orary/transient in buting to instability.	incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious bank sl Erosion/raw ban	stability. Severe tained within the do below average tajority of banks ut. Vegetative in less than 20% of venting erosion. Sughing present. It is on 80-100%.	
	sediment deposition	on covers less than	sediment cover	reach. Transient rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	e forming/present. ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar	on is present on > nks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	C		
Score				.4	L	2	1.		1		2.4		
NOTES>> 2. RIPARIAI	N BUFFERS: /	Assess both bank	d's 100 foot riparia	an areas along the		ugh measuremen	ts of length & wid	th may be accep	table)				
	Ont	imal		ditional Cate	gory Marginal Poor			NOTES>>					
Riparian Buffers	Tree stratum (dbh : with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.					
			High	Low	High	Low	High	Low					
Condition Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5					
descriptors. 2. Determine so pelow.	arian areas along quare footage for e Riparian Area and	each by measurin	g or estimating le	ngth and width. (	Calculators are pr		Ensure t of % R Blocks e	liparian qual 100					
Right Bank	% Riparian Area>	90%	10% 1.5					100%					
	JUJIE >	1.1	1.3						CI= (Sum % RA * S	cores*0.01)/2			
Left Bank	% Riparian Area>	90%	10%					100%	Rt Bank CI >	1.14	CI		
3. INSTREAL	Score > M HABITAT: Va				ody and leafy deb	bris; stable substr	ate; low embeded	lness; shade;	Lt Bank CI >	1.08	1.11		
	root mats; SAV; r	irrie poole comple	exes, stable featu	res. Conditiona	al Category								
Instream	Opt	imal		ptimal	Mar	ginal	Po						
Habitat/			<ul> <li>Stable babitat ele</li> </ul>	ments are typically		ments are typically		listed above are	l				
Habitat/ Available		re typically present	present in 30-509	% of the reach and	present in 10-309		lacking or are un						
Habitat/	in greater than 5		present in 30-50% are adequate fo popul		are adequate fo popul	% of the reach and or maintenance of lations.		ally present in less f the reach.		-	CI 1.20		

	St	ream In	npact A	ssessm	ent For	m Pag	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02080206	3/8/2016	06-STR-03		
	- ALTERATION: Stream cross poil piles, constrictions, livestock		Conditiona	l Category				NOTES>>	
ŀ	Negligible	IVII	nor	Mod	erate	Se	vere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	disrupted by an alterations listed guidelines AND/0 shored with ga	30% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or nent.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5	1	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Typical view of stream, facing west from driveway

NC DWQ Stream Identification Form Version 4.11

06-STR-03

Date: 3/8/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.665013
Evaluator: D. Mitchell	County: Henrico County	Longitude: -77.50574
Total Points: 34 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 15)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	_1	(2)	3
2. Sinuosity of channel along thalweg	0		2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	<b>(1)</b>	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	o = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual	<b>"</b>			ノ
B. Hydrology (Subtotal = 10 )				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 9				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0_	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method:	s. See p. 35 of manua	al.		
Notes: Field Sheet: 14-A-STRM-1.				
Sketch: culvert	driveway	FLOV	Stream	n 1
	/			

Optimal Suboptimal Marginal Poor Severe  Channel Condition Conditi			Stre		SSESS			-	m 1)			
NA DC2RVA - Area 06 VA R2 02080200 3/8/2016 PROPERTY OF THE PR	Droject #		Project Name						SAD#	Impact/SAR	Impact	
Name(s) of Evaluator(s)  D. Mitchell  Channel Condition  Condition  Condition  Condition  Suboptimal	•		•						SAR#	length	Factor	
D. Mitchell  Channel Condition: Assess the cross-section of the stream and prevaling condition (erosion, aggression)  Condition  Channel							02080206	3/8/2016				
Channel Channe	Hain	. ,	101(0)	Otrodin Hain		41011	06-S	ΓR-04				
Channel Condition Conditio	. Channel C	ondition: Asse	ess the cross-sec	ction of the stream	n and prevailing c	ondition (erosion,						
Channel Condition  Way little incidence or cache, eaction, and Condition  Con		Opti	mal	Subo				Po	or	Sev	vere	
Channel Condition Wey title in existion or active present exposition of the properties of the properti		The state of the s	Who have	1						1	5	
Score 3 2.4 2 1.6 1  NOTES>>  Field Sheet: 14-A-STRM-2.  2. RIPARIAN BUFFERS: Assess both banks 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Riginal areas with tree stratum (dsh > 3 inches) present with 5 of with 5 of width 60% tree acropy cover and or understory.  The stratum (dsh > 3 inches) present with 5 of With tree canopy cover and or understory.  If the stratum (dsh > 3 inches) present with 5 of With tree canopy cover and or understory.  If the stratum (dsh > 3 inches) present with 5 of With tree canopy cover and or understory.  Although the stratum (dsh > 3 inches) present with 5 of With tree canopy cover and or understory.  If the stratum (dsh > 3 inches) present with 5 of With tree canopy cover and or understory.  If the stratum (dsh > 3 inches) present with 5 of With tree canopy cover and or understory.  If the stratum (dsh > 3 inches) present with 5 of With tree canopy cover and or understory.  If the stratum (dsh > 3 inches) present with 5 of With tree canopy cover and or understory.  If the stratum (dsh > 3 inches) present with 5 of With tree canopy cover and or understory.  If the stratum (dsh > 3 inches) present with 5 of With tree canopy cover and or understory.  If the stratum (dsh > 3 inches) present with 5 of With tree canopy cover and or understory.  If the stratum (dsh > 3 inches) present in the stratum has a stratum that the stratum has a stratum that the stratum has a stratum that the stratum has a stratum that the stratum has a stratum that the stratum th		100% stable bar surface protection prominent (80-11 Stable point bars/l are present. Acce floodplain or fully bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches iss to their original of developed wide Mid-channel bars, ars few. Transient	erosion or unprote of banks are s Vegetative protec prominent (60 Depositional fea stability. The bar channels are we likely has access t or newly develope	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow all defined. Stream o bankfull benches, at floodplains along	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se- temporary/tran instability. Depositi	wer bank slopes. esent on 40-60% of tative protection on Streambanks may crcut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Maj are near vertical. Is 60-80% of ban protection prese banks, and is insu erosion. AND/O stream is coven Sediment is temp nature, and contril	ority of both banks Frosion present on ks. Vegetative int on 20-40% of ufficient to prevent R 60-80% of the ed by sediment. porary/transient in buting to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious banks le Erosion/raw ban	istability. Severe trained within the ed below average najority of banks cut. Vegetative on less than 20% of eventing erosion. oughing present. iks on 80-100%.	
Riparian Buffers  Conditional Category  Optimal Suboptimal Category  Optimal Suboptimal High Suboptimal Riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal High Suboptimal Riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal High Suboptimal Riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  NOTES>  Optimal Suboptimal High Suboptimal Riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  NOTES>  NOTES>  NOTES>  NOTES>  NOTES>  NOTES>  Optimal Suboptimal High Poor Lawring in the Riparian areas along each street a final business of the stratum, high Assignment and containing both understory. Vellands of the earth of the				sediment cove	rs 10-40% of the	vegetative protecti banks and deposit	on on > 40% of the onal features which	40% of the ba	nks and stable	than 80% of stream deposition, contrib Multiple thread	n bed is covered by outing to instability. channels and/or	(
Conditional Category    Conditional Category   Conditional Category	Score	3	3	2	2.4		2	1.	.6	1	1	2
Riparian Buffers  Riparian areas with tree stratum (bth > 3 inches) present, with > 60% free canopy cover and containing dunderstory. Welfand located within the riparian areas acopy cover and containing dunderstory.  High Low High Low High Low wegetation, with production, proposed and containing dunderstory.  Romalisated understory. Welfand located within the riparian areas. High Marginal with tree stratum, with > 60% free canopy cover and containing but on the production of the production, proposed and containing to the production of the production, proposed and containing to the production, proposed and containing to the production, proposed and containing to the production, proposed and containing to the production, proposed and tree stratum, that you wegetation with production, proposed and production, pro		Opti	imal				ĭ		oor	NOTES>>		
High   Low   High   High   Low   High   Low   High   H		with > 60% tree ca non-maintained und	anopy cover and a derstory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the lescriptors.  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the lescriptors.  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the lescriptors.  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the lescriptors.  Delineate riparian areas along each stream bank into Condition Category using the lescriptors.  Delineate riparian areas along each stream bank into Condition Category using the lescriptors.  Delineate riparian areas along each stream bank into Condition Category  Delineate riparian areas along each stream bank into Condition Category  Delineate riparian areas along each stream bank into Condition Category  Dolineal Suboptimal Marginal Poor  Stable habitat elements are typically Stable habitat elements are typically Stable habitat elements listed above are				High	Low	High		High	Low			
Lescriptors.   Lesc		1.	5	1.2	1.1	0.85	0.75	0.6	0.5			
Right Bank   % Riparian Area   80%   20%   100%	escriptors.  Determine sq elow.	uare footage for e	ach by measurin	g or estimating le	ngth and width. (	Calculators are pr		of % R	tiparian			
Cincom   C		· · · · · · · · · · · · · · · · · · ·							ri e e e e e e e e e e e e e e e e e e e	]		
Left Bank    Kiparian Area>   100%   Rt Bank Cl >   1.00	g.n. Dank	Score >	1.1	0.6						Cl= (Sum % RA * S	cores*0.01\/2	
Score > 1.1  Lt Bank Cl > 1.10  B. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; indercut banks; root mats; SAV; riffle poole complexes, stable features.  Conditional Category  Optimal Suboptimal Marginal Poor  Stable habitat lements are typically Stable habitat elements are typically Habitat elements listed above are		% Riparian Area>	100%						100%			C
Instream Habitat/ Stable habitat elements are typically Stable habitat elements are typically Stable habitat elements are typically Stable habitat elements are typically Stable habitat elements are typically Stable habitat elements are typically Stable habitat elements are typically	Loft Dani-										1.10	1.0
Instream Habitat/ Habitat/ Stable habitat elements are typically   Stable habitat elements are typically   Stable habitat elements are typically   Habitat elements listed above are								ata: law ambadas	Inacc: chada:	NOTES>>		
Habitat/ Augustustust  Stable habitat elements are typically   Stable habitat elements are typically   Habitat elements listed above are	B. INSTREAM	M HABITAT: Va	aried substrate si			ody and leafy del	oris; stable substr	ate, low embeded	iless, silade,	11012022		
	B. INSTREAM undercut banks;	M HABITAT: Va	aried substrate si iffle poole comple	exes, stable featu	res. Conditiona	al Category				11012022		
Cover in greater than 50% of the reach. are adequate for maintenance of are adequate for maintenance of elements are typically present in less	B. INSTREAM undercut banks; Instream Habitat/	M HABITAT: Va	aried substrate si iffle poole comple	exes, stable featu	res. Conditiona ptimal	al Category Mar	ginal	Po	oor			
populations.         populations.         than 10% of the reach.           Score         1.5         1.2         0.9         0.5	B. INSTREAM undercut banks; Instream Habitat/ Available	M HABITAT: Varoot mats; SAV; ri  Opti  Habitat elements al	aried substrate si iffle poole comple imal re typically present	Subo Stable habitat ele present in 30-50° are adequate fo	Conditiona ptimal ments are typically of the reach and maintenance of	Mar Stable habitat ele present in 10-30% are adequate fo	ginal ments are typically 6 of the reach and 7 maintenance of	Po Habitat elements lacking or are ui elements are typic	oor s listed above are nstable. Habitat ally present in less			C

	St	ream In	npact A	ssessm	ent For	m Pag	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	csx		VA	R2	02080206	3/8/2016	06-STR-04			
4. CHANNEL	L ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of ch	nannel, channeliz	zation,	NOTES>>		
embankments, s	poil piles, constrictions, livestock		Conditiona							
	Negligible	Mi	nor		erate	Sev	/ere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0 shored with ga	30% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or nent.			CI
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			0.70
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IIS REACH			
NOTE: The CIs and R	RCI should be rounded to 2 decimal places. T	The CR should be roun	nded to a whole number	er.				CONDITION INI		
								I= (Sum of all C		0
								ON REQUIREM	IENI (CK) >>	0
INSERT PHO	TOC.						OK = NO	IXLIXII		
DESCRIBE E	PROPOSED IMPACT:									
DESCRIBE F	PROPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11

06-STR-04

Date: 3/8/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.660825
Evaluator: D. Mitchell	County: Henrico County	Longitude: -77.505888
<b>Total Points:</b> $35.5$ Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 17)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	_1	2	3
Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	(1)	2	3
ripple-pool sequence 4. Particle size of stream substrate	0		(2)	3
Active/relict floodplain	0	(1)	2	3
•				
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1		3
8. Headcuts	0	<u> (1)</u>	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 9)	<del></del>			
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 9.5)	•			
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	(E)	1	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed			OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method	ds. See p. 35 of manua		032	
Notes: Adjacent to Wetland 1 (March 8). Field Sh				
Troited in Space in the Troited in (March 6). I fold on	223	<del></del>		
4				
Sketch:		and the same		
ll culvert	<b>=</b>	FLOW		
N / Culvert				
T +th	-			
1/1				
V H				
-				

	U			Stream Assessment Form (Form 1) Unified Stream Methodology for use in Virginia For use in wadeable channels classified as intermittent or perennial							
Project #		Project Name		wadeable chan	cowardin Class.	s intermittent or	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	06	VA	R2SB3	02080206	3/8/2016		lengui	1 actor	
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
L. Egg	jering & D. N	litchell				06-S	ΓR-05				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal	conditional Categor	ry ginal	Po	or	Sev	ere	
	1	W AND	1			less than Severe or	Overwiden		1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	inks. Vegetative in or natural rock, 100%). AND/OR /bankfull benches less to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are stogetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to rewly develope	ew areas of active cted banks. Majority table (60-80%). titon or natural rock-80%) AND/OR tures contribute to nkfull and low flow III defined. Stream o bankfull benches, def loodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may errut. AND/OR 40- n is covered by diment may be sisent, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. orary/transient in buting to instability.	Deeply incised vertical/lateral ininicision, flow con banks. Streambe rooting depth, m vertical/lunderc protection present obanks, is not pre Obvious bank st. Erosion/raw ban AND/OR Aggrading	stability. Severe tained within the de below average hajority of banks ut. Vegetative on less than 20% of vventing erosion. Dughing present. ks on 80-100%.	
	sediment deposition 10% of	on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depos	nks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	С
Score	3	3	2	2.4		2	1.	6	1		2.0
2. RIPARIAI	N BUFFERS: /	Assess both bank	Con	an areas along the	gory	ugh measuremen	ts of length & wid		table)		
Riparian Buffers	Opti Tree stratum (dbh: with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con	ditional Cate	gory						
Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cr. non-maintained un	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 80%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate rip descriptors. Delineate rip descriptors. Enter the %	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of t	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating leparian category in	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100		cores*0.01)/2	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 20% 1.1	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 80% 0.6	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	0.70	CI
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree cz non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Vi	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 20% 1.1  20% 1.1  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 80% 0.6  80% 0.6	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (In the blocks below ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/">https://doi.org/10.100/j.nc/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * Si		CI 0.7
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the %  Right Bank  Left Bank  3. INSTREAl undercut banks;	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 20% 1.1  20% 1.1  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 80% 0.6  80% 0.6	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (In the blocks below ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.70	
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree ca non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Score >  W HABITAT: Va root mats; SAV; r	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 20% 1.1  20% 1.1  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 80% 0.6  80% 0.6  2es, water velocit exes, stable featu	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (count the blocks below ty and depths; wo res.  Conditiona ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.70	
Condition Scores  Delineate rip descriptors. Enter the % Right Bank  Left Bank  Left Bank  INSTREAl undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree conon-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> core >  M HABITAT: Wood mats; SAV; r  Opti Habitat elements a	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  20%  1.1  20%  1.1  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 80% 0.6  80% 0.6  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically & of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks ended to the blocks ended	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed older conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.70	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cz non-maintained un- located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Vi root mats; SAV; r  Opti  Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  20%  1.1  20%  1.1  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 80% 0.6  80% 0.6  Subo Stable habitat ele present in 30-509 are adequate fo popul	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below ty and depths; wo res.  Conditional pptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to f % R Blocks end	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  he sums iparian qual 100  100%  100%  Iness; shade;	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.70	

	St	ream In	npact A	ssessm	ent For	m Pag	e 2		
Project #	Applicant		Locality	cality Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX	VA	R2SB3	02080206	3/8/2016	06-STR-05			
	ALTERATION: Stream cross poil piles, constrictions, livestock		Conditiona	al Category			ration,	NOTES>>	
	Negligible	IVIII	nor		erate 60 - 80% of reach	Sev	rere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel alterations listed in the parameter guidelines. If	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed	OR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Typical view of stream, facing east toward culvert under railroad

Top Right: Typical upstream view of stream, facing away from the railroad Bottom Right: Typical view, facing downstream toward culvert under railroad



NC DWQ Stream Identification Form Version 4.11

06-STR-05

Date: 3/8/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.658672
Evaluator: D. Mitchell	County: Henrico County	Longitude: -77.506073
<b>Total Points:</b> $34.75$ Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 15.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	_1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0		2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0		2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	
<sup>a</sup> artificial ditches are not rated; see discussions in manual			1 (133	<del>`</del>
B. Hydrology (Subtotal = $\frac{9}{}$ )			_	
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	o = 0	Yes:	= 3
C. Biology (Subtotal = 10.25				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed	<u> </u>	EACW = 0.75	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other metho	ods. See p. 35 of manua			
Notes: Adjacent to Wetland 1 (March 8). Field Sh	•			
Sketch:	N Stream 4	Stream	3 FLOW	
culv	ert		-	

		Stre				Form for use in Virg	) (For	m 1)			
		D N			nels classified a	s intermittent or		212 "	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		C2RVA - Area		VA	R4SB	02080206	3/8/2016				
Nam	e(s) of Evalua  D. Mitchell	itor(s)	Stream Nam	e and Informa	ation	06-87	ΓR-06				
. Channel C	Condition: Asse	ess the cross-sec	ction of the stream	and prevailing c	ondition (erosion		111-00				
. 0114111101		imal			Conditional Catego		Po	Or.	Sev	oro	
		- Jan	The state of the s		1	less than Severe or	Overwiden	5	1	5	
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse bar	on or natural rock, 100%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient on covers less than	erosion or unproted of banks are sit Vegetative protect prominent (60-Depositional feat stability. The bar channels are wel likely has access to or newly develope portions of the resediment cover	ew areas of active cted banks. Majority table (60-80%). It con or natural rock-80%) AND/OR ures contribute to kifull and low flow II defined. Stream o bankfull benches, of floodplains along reach. Transient s 10-40% of the bottom.	Poor. Banks more or Poor due to Ic Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of stream sediment. Se temporary/tran instability. Depositistability. Depositistability. Depositistability. Depositistability may be AND/OR V-shap vegetative protecti	stable than Severe wer bank slopes: sesent on 40-60% of tative protection on Streambanks may rerut. AND/OR 40- n is covered by diment may be sisent, contribute on that contribute to torming/present. ed channels have ion on > 40% of the	Vertically/laterally widen further. Maja ren ear vertical. E 60-80% of banl protection prese banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrit. AND/OR V-shaped vegetative protection.	unstable. Likely to ority of both banks rosion present on ks. Vegetative at 02-40% of fficient to prevent corary/transient in unting to instability. dichannels have on is present on > iks and stable	Deeply incised vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/lunderc protection present to banks, is not pre Obvious bank sik Erosion/raw ban AND/OR Aggradin, than 80% of stream deposition, contrib	stability. Severe tained within the di below average ajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%. g channel. Greater i bed is covered by	CI
						ional features which to stability.	sediment depos	ition is absent.	Multiple thread of subterran	channels and/or	Ci
Score	3	3	2	.4		2	1.	6	1		2.0
NOTES>>						14-A-STRM					
. RIPARIAI	N BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt	h may be accep	table)		
. RIPARIAI			Con	ditional Cate	gory				NOTES>>	411	
Riparian Buffers	Opti	imal  > 3 inches) present anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.		High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation,	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.		NOTES>> Rail on rigl lawn on lef		
Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/40.700/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present</a></a></a></a></a>	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Rail on rigl lawn on lef		
Riparian Buffers  Condition Scores  Delineate ripaescriptors.	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2 k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">30% tree canopy cover.</a> High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Rail on rigl lawn on lef		
Riparian Buffers  Condition Scores  Delineate ripaescriptors. Determine scolelow.	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  .5  each stream ban each by measuring	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Rail on rigl lawn on lef		
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % F	Tree stratum (dbh : with > 60% tree conon-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  .5  each stream ban each by measuring	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Rail on rigl lawn on lef		
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % F	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  .5  each stream ban each by measurin Score for each r 5% 1.1	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 95% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	NOTES>> Rail on rigl lawn on lef	t bank.	
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % F	Tree stratum (dbh a with > 60% tree conon-maintained una located within the located withi	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  .5  each stream ban each by measurin Score for each r 5% 1.1	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 95% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Rail on rigl lawn on lef  Cl= (Sum % RA * S Rt Bank Cl >	cores*0.01)/2	CI 0.59
Riparian Buffers  Condition Scores  Delineate ripasscriptors. Determine scelow. Enter the % f	Tree stratum (dbh : with > 60% tree conon-maintained und located within the located withi	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  .5  each stream ban each by measurin  Score for each r  5%  1.1  10%  1.1  arried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le sparian category in 95% 0.5	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Rail on rigl lawn on lef	t bank.	CI 0.59
Condition Scores  Delineate rips scriptors. Determine scolow. Enter the % f Right Bank  Left Bank  INSTREAL	Tree stratum (dbh : with > 60% tree ca non-maintained un located within th located within th located within th strain areas along quare footage for e Riparian Area and % Riparian Area > Score > M HABITAT: Varoot mats; SAV; r	imal  > 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  .5  each stream ban each by measuring the stream	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 95% 0.5	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other conference conditions.  Low 0.5  Low 100%  100%	NOTES>> Rail on rigl lawn on lef  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % If Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/	Tree stratum (dbh : with > 60% tree cc on non-maintained und located within the located w	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  .5  each stream ban each by measurin Score for each r 5% 1.1  10% 1.1  arried substrate si ifffle poole completimal	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 95% 0.5  90% 0.6  izes, water velocit exes, stable featur  Subo Stable habitat elei	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below the product of the blocks below the product	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  W.  In Category  Mar  Stable habitat ele	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks end Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Rail on rigl lawn on lef  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % f Right Bank  Left Bank  B. INSTREAI ndercut banks; Instream	Tree stratum (dbh : with > 60% tree cc on non-maintained und located within the located w	imal  > 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  5  each stream ban each by measuring score for each reach stream ban each by measuring score for each reach reach stream ban each by measuring score for each reach stream ban each by measuring score for each reach stream ban each by measuring score for each reach stream ban each by measuring score for each reach stream ban each by measuring score for each reach stream ban each by measuring score for each reach stream ban each by measuring score for each reach stream ban each by measuring score for each reach score for each reach stream ban each by measuring score for each reach reach score for each reach score for each reach reach score for each reach	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 95% 0.5  90% 0.6  Stable habitat ele present in 30-50% sare adequate fo	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Tategories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrud layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High 0.85  Calculators are provided at Category Mar Stable habitat ele present in 10-30 are adequate for are dequate for a sea dequate for a se	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you  ginal	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tf  of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	NOTES>> Rail on rigl lawn on lef  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	cores*0.01)/2	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor R4SB 02080206 3/8/2016 06-STR-06 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. is disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer shored with gabion, riprap, or channelized, channelized, the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. CI SCORE 1.5 0.5 1.3 1.1 0.9 0.7 0.70 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

INSERT PHOTOS:





NC DWQ Stream Identification Form Version 4.11

06-STR-06

1.5

1.5

1.5

Date: 3/8/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.658315
Evaluator: D. Mitchell	County: Henrico County	Longitude: -77.506104
<b>Total Points:</b> 20.5 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemera Intermittent Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*	Epnemeral Inte	rmittent	al e.g. Quad Name:	1
A. Geomorphology (Subtotal = 7)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
Sinuosity of channel along thalweg	0	$\overline{}$	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	1)	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 7)				
12. Presence of Baseflow	0	1)	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	(1)_	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 6.5				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
		-		

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Flow to Stream 3. Stream 4 drains Wetland 2. Field Sheet: 14-A-STRM 4.

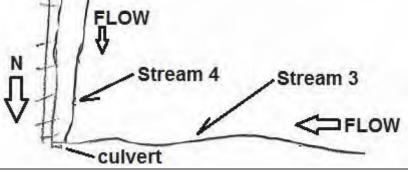


23. Crayfish

25. Algae

24. Amphibians

26. Wetland plants in streambed



0

0

0.5

0.5

(0.5)

FACW = 0.75; OBL = 1.5 Other = 0

										fied Stream N wadeable chan					Impact/SAR Impact	
Project #		Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor						
N/A	DC	2RVA - Area	06	VA	R6SB3	02080206	3/8/2016									
	ne(s) of Evalua	. ,	Stream Nam	e and Informa												
	gering & D. N				06-STR-07											
nannel (				C	Conditional Catego	ry										
	Opti	imal	Subo	ptimal	Mar	ginal	Po	or	Sev	rere						
	-		T			less than Severe or	Overwidend		1	5						
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse bar	n or natural rock, 00%). AND/OR bankfull benches ess to their original developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are stylegetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to riewly develope	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, defloodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe ewer bank slopes. seent on 40-60% of lative protection on Streambanks may rout. AND/OR 40- h is covered by diment may be sient, contribute to forming/oresent.	widen further. Maj	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the d by sediment. orary/transient in uting to instability.	Deeply incised vertical/lateral in: incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank slc Erosion/raw ban	stability. Severe trained within the ad below average lajority of banks ut. Vegetative on less than 20% or eventing erosion. bughing present. ks on 80-100%.						
	sediment deposition 10% of		sediment cover	rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protectic 40% of the bar sediment depos	ks and stable	AND/OR Aggrading channel Greate							
Score	3	3	2	2.4	;	2	1.	6	1							
NOTES>>				ביטוא פו	haati Etraa	m 5 11 A 9	STDM 5									
	N BUFFERS: A	Assess both bank	s's 100 foot riparia			m 5 14-A-3		h may be accep	table)							
			Con	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt		NOTES>>	OV 11						
	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy	e entire SAR. (roo	-										
RIPARIAI Riparian Buffers	Tree stratum (dbh : with > 60% tree cc non-maintained una located within th	imal  3 inches) present, anopy cover and a defestory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> Parallels C transitions							
RIPARIAI Riparian Buffers	Opti Tree stratum (dbh swith > 60% tree canon-maintained und	imal  3 inches) present, anopy cover and a defestory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or or other comparable conditions.	NOTES>> Parallels C transitions							
Riparian Buffers  Condition Scores  Delineate rip Secriptors. Determine scores Determine scores Leter the %	Tree stratum (dbh: with > 60% tree conon-maintained un located within the located within	imal  3 inches) present, enopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutvoer (dense vegetation).  Low 1.1  Categories and Coungth and width. Coungth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Parallels C transitions							
RIPARIAI Riparian Buffers  Condition Scores Delineate ripscriptors. Determine sclow. Enter the %	Tree stratum (dbh: with > 60% tree conon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wellands e riparian areas.  5.5  each stream ban each by measuring Score for each r	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutvoer (dense vegetation).  Low 1.1  Categories and Coungth and width. Coungth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Parallels C transitions Wetland 2.	into						
RIPARIAI Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine sclow. Enter the %	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin Score for each r 100% 1.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutvoer (dense vegetation).  Low 1.1  Categories and Coungth and width. Coungth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Parallels C transitions	cores*0.01)/2 1.50						
RIPARIAI Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine scow. Enter the % Right Bank	Tree stratum (dbh a with a 60% tree cc non-maintained una located within the located with	imal  3 inches) present, anopy cover and a destroy. Wellands e riparian areas.  5  each stream ban each by measurin  Score for each r  100%  1.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coveright and width. Con the blocks below	Be entire SAR. (rongory  Mary  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dh) > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prove	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with amaintained understory.  Low  0.75 sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt  of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Parallels C transitions Wetland 2.  Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl >	into						
RIPARIAI  Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine solow. Enter the % Right Bank  Left Bank	Tree stratum (dbh : with > 60% tree cc conon-maintained unclocated within the located wit	5  sach stream ban ach by measurin 100% 1.5  100% 1.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	an areas along the ditional Categories and Coungth and width. Categories and Coungth and Width. Categories a	Be entire SAR. (rongory  Mary  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dh) > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prove	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with amaintained understory.  Low  0.75 sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Parallels C transitions Wetland 2.  Cl= (Sum % RA * Si Rt Bank Cl >	cores*0.01)/2 1.50						
Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine sc low. Enter the % Right Bank  Left Bank  INSTREAI	Tree stratum (dbh: with > 60% tree conon-maintained un located within th  1. carian areas along of the stratum areas along of the stratum area and score >  M Riparian Area > Score >  M HABITAT: Va; root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands er liparian areas.  5  each stream ban each by measuring the stream ban 100%  1.5  100%  1.5  aried substrate si ifftle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coongth and width. (con the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provious and leafy det al Category	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure ti  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, other comparable conditions.  Low 0.5  Low 10.5  Low	NOTES>> Parallels C transitions Wetland 2.  Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2 1.50						
Riparian Buffers  Condition Scores  Delineate rip Secriptors Determine scolow. Enter the % Right Bank  Left Bank  INSTREAI Instream Habitat/	Tree stratum (dbh : with > 60% tree cc non-maintained un located within th  1. carian areas along a quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Va ; root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands deristory. Wetlands er riparian areas.  5  each stream ban each by measurin  Score for each r  100%  1.5  100%  1.5  arried substrate si iffle poole completimal	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in  zes, water velocit exes, stable featu  Subo  Stable habitat ele	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Count the blocks below ty and depths; wo res.  Conditional primal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt  of % R Blocks ed  Blocks ed  High  Deliver to the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	NOTES>> Parallels C transitions Wetland 2.  Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2 1.50						
Riparian Buffers  Condition Scores Delineate rip scriptors. Determine solow. Enter the % I	Tree stratum (dbh : with > 60% tree cc non-maintained un located within th  1. carian areas along a quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Va ; root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands er liparian areas.  5  each stream ban each by measuring the stream ban 100%  1.5  100%  1.5  aried substrate siffle poole completimal  re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in the containing le parian category in the category in the containing le parian category in the containing le parian category in the containing le parian category in the category in the category in the category in the category in the category in the category in t	an areas along the ditional Categoriem al  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Coungth and width. Coungth and width. Coungth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory. Low  0.75  Sing the ovided for you  pris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-fill cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	NOTES>> Parallels C transitions Wetland 2.  Cl= (Sum % RA * St Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2 1.50						

	St	ream In	npact A	ssessm	ent For	m Pag	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX	VA	R6SB3	02080206	3/8/2016	06-STR-07			
	ALTERATION: Stream cross poil piles, constrictions, livestock	ings, riprap, cond			straightening of ch	nannel, channeliz	zation,	NOTES>>	
	Negligible	Mi	Conditiona nor		erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	disrupted by an alterations listed guidelines AND/0	in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: Typical view of stream Bottom Right: Typical view of stream

NC DWQ Stream Identification Form Version 4.11

06-STR-07

Date: 3/8/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.656353
Evaluator: D. Mitchell	County: Henrico County	Longitude: -77.506542
<b>Total Points:</b> 21.75 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemera Intermittent Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*	Ephemeral inter	Tillitte iit Pereiiii	e.g. Quad Name.	
A. Geomorphology (Subtotal = 7.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0		2	3
Sinuosity of channel along thalweg	0	$\overline{(1)}$	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1)	2	3
5. Active/relict floodplain	0	<b>(1)</b>	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	9	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	=0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 6.5 )  12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No	=0	Yes:	= 3
C. Biology (Subtotal = $7.75$ )				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	(2)	Y	0
20 Macrobenthos (note diversity and abundance)	0	1		3

C. Diology (Subtotal = $\frac{7.75}{}$ )				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	(2)	7	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75; C	OBL = 1.5 Other = 0	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Intermittent channel transitions into Wetland 2. Field Sheet: 14-A-STRM-5, Stream 5.

Sketch: fence
Wetland 2
walking
bridge

		Stre		ssess			-	m 1)			
				fied Stream N wadeable chan							
Project #	F	Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	06	VA	R2	02080206	3/7/2016				
Nam	e(s) of Evaluat	tor(s)	Stream Nam	e and Informa		•	1				
	D. Mitchell						(Hungry (	Creek)			
. Channel C	Condition: Asse			С	onditional Catego	ry					
	Optimal		Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	· J	AND STATES		ew areas of active	Poor. Banks more	less than Severe or	Overwidene Vertically/laterally	unstable. Likely to	Deeply incised	(or excavated),	
Channel Condition	Very little incision or 100% stable bar surface protectior prominent (80-11 Stable point bars/t are present. Acce- floodplain or fully bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 20%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars, ars few. Transient	of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow ill defined. Stream o bankfull benches, et floodplains along reach. Transient	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes. resent on 40-60% of vatative protection on Streambanks may prcut. AND/OR 40- n is covered by diment may be sisient, contribute on that contribute to the forming/present.	60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in		vertical/lateral in incision, flow cor banks. Streamble rooting depth, n vertical/underc protection present banks, is not pre Obvious banks lerosion/raw bar	stability. Severe ntained within the ad below average najority of banks sut. Vegetative on less than 20% of eventing erosion. bughing present.	
	sediment deposition 10% of b		sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protectic 40% of the bar sediment depos	iks and stable		b bed is covered by buting to instability. channels and/or	C
Score	3	1	2	2.4		2	1.	6	,	I	2.
NOTES>>				Fie	eld Sheet:	14-A STRN	1-3.				
. RIPARIAN	N BUFFERS: A	ssess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	uah measuremen	ts of length & widt	h may be accep	table)		
. RIPARIAN	N BUFFERS: A	ssess both bank		an areas along the		ugh measuremen	ts of length & widt	th may be accep	table)		
. RIPARIAN	N BUFFERS: A		Con		gory	ginal	ts of length & widt			w from	
RIPARIAN Riparian Buffers		mal  3 inches) present, nopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	constant of the carbon with the stratum (dbh > 3 inches) present, with > 30% tree canopy	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ir parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained		Or  Low Poor:	NOTES>> Stream flowetland to on other si Hungry Sp Stream flowership under the i	the west de of rings Rd. ws east	
Riparian	Opti  Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> Stream flowetland to on other si Hungry Sp Stream flowership under the i	the west de of rings Rd. ws east	
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Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % f Right Bank  Left Bank  B. INSTREAL	Tree stratum (dbh > with > 60% tree ca a non-maintained unclocated within the located wit	mal  3 inches) present, nopy cover and a leerstory. Wetlands riparian areas.  5  each stream ban ach by measurin  Score for each r  60%  1.5  100%  1.2  arried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 40% 1.2  Zes, water velocii	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the control of the con	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel olds, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Stream flowetland to on other signature of the stream flower the stream flower the stream flower the stream flower the stream flower the stream flower the stream flower the stream flower the stream flower the stream flower the stream flower the stream flower f	the west de of rings Rd. ws east railroad.	
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Project	Project #   Applicant		St	ream In	npact A	ssessm	ent For	m Pag	e 2			
A. CHANNEL ALTERATION: Stream crossings, spray, concrete, genores, or concrete books, straightering of channel, channels, channels, conditions. Category  Negligible  North Moderate  Lass the 20% of the second construction of the channel of the ch	4. CHANNEL ALTERATION: Stream crossleps, ryme, concrete, gabons, or concrete books, streightening of channel, channel crisis, and place, considering, brestock    Nogligible   Minor   Moderate   Severe	Project #								SAR length	Impact Factor	
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Channel Alteration Channel Cha	Channel Alteration Change plantage and search control to a search	,		Mir			orato	Ser	/ere			
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Sum of all Cl'sly/5  COMPENSATION REQUIREMENT (CR) >>  OR = RCI X LF X IF  INSERT PHOTOS:	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  OTHER THE Class and RCI abouted to 2 decisined places. The CR should be recorded to a whole number.    THE REACH CONDITION INDEX (RCI) >>   RCI   (Sum of all Cl  s))/5		Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	Greater than to disrupted by an alterations listed guidelines AND/M shored with ga	30% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or			CI
NOTE: The Cits and RCI should be rounded to 3 decimal places. The Cit should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Sum of all Cits)-5  COMPENSATION REQUIREMENT (CR) >>  OCCUPATION OF THE REACH CONDITION INDEX (RCI) >>  INSERT PHOTOS:	NOTE: The Cis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number:    THE REACH CONDITION INDEX (RCI) >>	SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			1.30
RCL (Sum of all CIS)/S  COMPENSATION REQUIREMENT (CR) >> 0  CR = RCI X LF X IF  INSERT PHOTOS:	RCI= (Sum of all C19)/5  COMPENSATION REQUIREMENT (CR) >> 0  CR = RCI X LF X IF  INSERT PHOTOS:						NDITION UN	ITS FOR TH				
COMPENSATION REQUIREMENT (CR) >>> 0  CR = RCI X LF X IF  INSERT PHOTOS:	COMPENSATION REQUIREMENT (CR) >> 0  CR = RGI X LF X IF  INSERT PHOTOS:	NOTE: The CIs and F	RCI should be rounded to 2 decimal places. T	he CR should be roun	ded to a whole number	er.						
INSERT PHOTOS:  CR = RCI X LF X IF	INSERT PHOTOS:  CR = RCI XLF X IF											0
											(4.1)	•
		DESCRIBE F	PROPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11 Hungry Creek 06-STR-08

Date: 3/7/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.647732
Evaluator: D. Mitchell	County: Henrico County	Longitude: -77.507690
<b>Total Points:</b> $35.5$ Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 16)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	(1)	2	3
ripple-pool sequence				_
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0		2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	$\bigcirc$	2	3
8. Headcuts	0	<u> </u>	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	= 0	Yes	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 9.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes:	= 3
C. Biology (Subtotal = 10 )				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	1	FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other methods.	See p. 35 of manual			
Notes: Field Sheet: 14-A-STRM-3.				
Sketch.	Hungry Sp	rings Rd	wetlar	nd

		Stre	Uni	SSESS fied Stream N	lethodology f	or use in Virg	ginia	· · · · · · · · · · · · · · · · · · ·			
Project #		Project Name		wadeable chan	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date			Impact Factor	
N/A	DC2RVA - Area 06		06	VA	R2SB4	02080206	3/8/2016		length	Factor	
Nam			Stream Nam	e and Informa	ation						
	D. Mitchell					06-S	ΓR-09				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	Optimal		ptimal	onditional Catego	ginal	Po	or	Sev	ere	
	1	WAR OF THE PERSON OF THE PERSO	1			less than Severe or	Overwiden		1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or full) bankfull benches. and transverse ba	inks. Vegetative in or natural rock, 100%). AND/OR /bankfull benches less to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are stogetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to or newly develope	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow III defined. Stream o bankfull benches, defloodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe wer bank slopes. esent on 40-60% of lative protection on Streambanks may creat. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks frosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. iorary/transient in puting to instability.	Deeply incised vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/lunderc protection present c banks, is not pre Obvious bank slt Erosion/raw ban AND/OR Aggradin	stability. Severe tained within the dd below average ajority of banks ut. Vegetative in less than 20% of venting erosion. bughing present. ks on 80-100%.	
	sediment deposition 10% of	on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	40% of the bar	ection is present on > banks and stable eposition is absent. than 80% of deposition Multiple		h bed is covered by uting to instability. channels and/or ean flow.	С
Score	3	3	2	2.4	:	2	1.	6	1		2.
						-	1-7.				
2. RIPARIAN	BUFFERS: Ass		Con	ditional Cate	gory		urements of len		y be acceptable)		
2. RIPARIAN Riparian Buffers	Opti	imal > 3 inches) present, anderstory. Wetlands	Con		gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a href="mailto:salarara">salarara</a> inches) present, with <a href="mailto:salarara">salarara</a> inches) present, unith <a href="mailto:salarara">salarara</a> inches) present, unith <a href="mailto:salarara">salararara</a> inches) present, unit salarararararararararararararararararara					
Riparian Buffers	Opti Tree stratum (dbh: with > 60% tree canon-maintained unlocated within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropiand; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, tralls, or other comparable			
Riparian	Opti Tree stratum (dbh: with > 60% tree canon-maintained unlocated within th	imal > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed loot, trails, or lother comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strain areas along quare footage for experience and strain areas along quare along quare and strain areas along quare along quare along quare along quare along quare along quare along quare along quare along quare along quare along quare along quare along	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition Co g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (dense)	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree conon-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (dense)	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>>		
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % Right Bank	Tree stratum (dbh: with > 60% tree ca non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri 80% 1.2	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.85	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (dense)	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel olts, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5		cores*0.01)/2	CI
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % l	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strain areas along quare footage for experience and the strain area and the strain area and the strain area and the strain area and the strain area	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5 each stream ban each by measurin Score for each ri 80%	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (dense)	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>>  Cl= (Sum % RA * Si		<u>CI</u>
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree canon-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  80%  1.2  80%  1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.85	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (In the blocks below the suboptimal of the blocks below the suboptimal of the blocks below the suboptimal of the blocks below the suboptimal of the blocks below the suboptimal of the blocks below the suboptimal of the blocks below the suboptimal of the blocks below the suboptimal of the blocks below the suboptimal of the blocks below the suboptimal of the suboptimal of the blocks below the suboptimal of	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel olst, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si  Rt Bank Cl >	cores*0.01)/2 1.13	
Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5.5  each stream ban each by measurin 80% 1.2  80% 1.2  aried substrate si iffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.85	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. ( In the blocks below ty and depths; wo res.  Conditiona	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	Cl= (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2 1.13	
Condition Scores  1. Delineate rip descriptors, 2. Determine sc below. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks, Instream Habitat/ Available	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5.5  each stream ban each by measurin 80% 1.2  80% 1.2  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.85  20% 0.85  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. ( In the blocks below ty and depths; wo res.  Conditiona ptimal ments are typically % of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically 6 of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e  Habitat elements lacking or are un	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	Cl= (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2 1.13	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree conon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5.5  each stream ban each by measurin 80% 1.2  80% 1.2  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 20% 0.85  20% 0.85  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ditional Cate ptimal Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low 1.1  Categories and Coungth and width. (and the blocks below ty and depths; wo res. Conditional ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R Blocks e  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%  Iness; shade;	Cl= (Sum % RA * Si Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2 1.13	

N/A CSX VA R2SB4 02080206 3/8/2016 06-STR-09  4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock    Conditional Category   Negligible   Minor   Moderate   Severe		St	ream In	pact A	ssessm	ent For	m Pag	e 2		
Alteration  Channel Alteration  Channel Alteration  Channel Alteration  Channel Alteration  Channel Alteration  Channel Alteration  Channel Alteration  Channel Channe	Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
Channel Alteration  Channelization, dredging, alteration or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has an unalterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not pattern	N/A	CSX	VA	R2SB4	02080206	3/8/2016	06-STR-09			
Channel Alteration  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander guidelines. If stream has been channelized, normal stable stream meander guidelines. If stream has been channelized, normal stable stream meander pattern has not to pattern has not to the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not to the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not to the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not to the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not to the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not to the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not to the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not to the parameter guidelines. If stream has not to the parameter guidelines. If stream has not to the parameter guidelines. If stream has not to the parameter guidelines. If stream has not to the parameter guidelines. If stream has not to the parameter guidelines. If stream has not to the parameter guidelines. If stream has not to the parameter guidelines. If stream has not to the parameter guidelines. If stream has not to the parameter guidelines. If stream has not to the parameter guidelines. If stream has not to the parameter guidelines. If stream has not to the parameter guidelines. If stream has not to the parameter guidelines. If stream has not to the parameter guidelines. If stream has not to the parameter guidelines. If stream has not to the parameter guidelines. If stream has not to the paramet		bankments, spoil piles, constrictions, livestock							NOTES>>	
		Channelization, dredging, alteration, or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not	Greater than 8 disrupted by an alterations listed guidelines AND/0 shored with ga	80% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or		
		REACH C	ONDITION IN	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

**INSERT PHOTOS:** 



Top Left: Culvert carrying stream under railroad Bottom Right: Typical view of stream



NC DWQ Stream Identification Form Version 4.11

06-STR-09

1.5

1.5

1.5

Date: 3/8/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.637970
Evaluator: D. Mitchell	County: Henrico County	Longitude: -77.505878
<b>Total Points:</b> 33.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*	Epnemeral Intermittent Perennial e.g. Quad Name:					
A. Geomorphology (Subtotal = 14)	Absent	Weak	Moderate	Strong		
1 <sup>a.</sup> Continuity of channel bed and bank	0	_1	2	3		
2. Sinuosity of channel along thalweg	0		2	3		
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3		
4. Particle size of stream substrate	0	<u>(</u> )	2	3		
5. Active/relict floodplain	0	1	2	3		
6. Depositional bars or benches	0	(1)	2	3		
7. Recent alluvial deposits	0		2	3		
8. Headcuts	0	1	2	3		
9. Grade control	0	0.5	1	1.5		
10. Natural valley	0	0.5		1.5		
11. Second or greater order channel	No	0 = 0	Yes = 3			
<sup>a</sup> artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = $\frac{9}{}$ )						
12. Presence of Baseflow	0	1	2	(3)		
13. Iron oxidizing bacteria	0	(1)	2	3		
14. Leaf litter	1.5	1	0.5	0		
15. Sediment on plants or debris	0	0.5	1	1.5		
16. Organic debris lines or piles	0	0.5	1	1.5		
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3		
C. Biology (Subtotal = $10.75$ )						
18. Fibrous roots in streambed	3	(2)	1	0		
19. Rooted upland plants in streambed	3	(2)	1	0		
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3		
21. Aquatic Mollusks	(0)	1	2	3		
22. Fish	Ō	0.5	$\mathfrak{Q}$	1.5		

26. Wetland plants in streambed

\*perennial streams may also be identified using other methods. See p. 35 of manual.

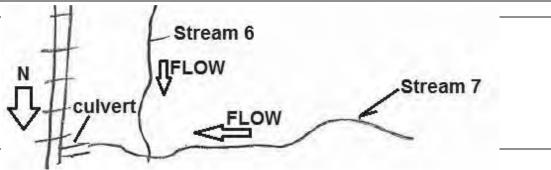
Notes: Field Sheet: 14-A-STRM-7.

Sketch:

23. Crayfish

25. Algae

24. Amphibians



0

0

0.5

0.5

0.5

FACW = 0.75;

OBL = 1.5 Other = 0

	Epho				lethodology f		inia				
Project #		Project Name	)	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area		VA	R6	02080206	3/8/2016				
	e(s) of Evalua gering & D. N		Stream Nam	e and Informa	ation	06-S1	ΓR-10				
2. RIPARIAN	BUFFERS: A	ssess both bank's			entire SAR. (rough	measurements of	f length & width m	ay be acceptable)			
	Opt	imal		nditional Cate ptimal	gory <u>Mar</u> g			or	NOTES>> 14-STR-06		
Riparian Buffers	with > 60% tree ca	> 3 inches) present, unopy cover and an derstory. Wetlands ass.		3 inches) present, with >30% tree canopy cover and a	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (bth >3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Condition Scores	1	.5	1.2	1.1	0.85	0.75	0.6	0.5			
Delineate ripa					ition Scores using culators are provid		Ensure t	he sums tiparian			
3. Enter the % R	Riparian Area and S			he blocks below.			Blocks e	qual 100			
Right Bank	% Riparian Area> Score >	60% 1.5	40% 0.5					100%			
	% Riparian Area>	100%						100%	CI= (Sum % RA * So Rt Bank CI >	ores*0.01)/2	CI
Left Bank	Score >	1.5						10070	Lt Bank Cl >	1.50	1.30
		REACH (	CONDITION	INDEX and S	TREAM CON	IDITION UNI	TS FOR THIS				
NOTE: The CIs and R	CI should be rounded					IDITION UNI	TS FOR THIS	THE REACH	CONDITION IND	· ,	0.65
						IDITION UNI	TS FOR THIS	THE REACH	CONDITION IND CI= (Riparian CI)/ TON REQUIREM I X LF X IF	2	
						IDITION UNI	TS FOR THIS	THE REACH	CI= (Riparian CI)/ TION REQUIREM	2	0.65
INSERT PHO		to 2 decimal places. Ti				IDITION UNI	TS FOR THIS	THE REACH	CI= (Riparian CI)/ TION REQUIREM	2	0.65
INSERT PHO	OTOS:	to 2 decimal places. Ti				IDITION UNI	TS FOR THIS	THE REACH	CI= (Riparian CI)/ TION REQUIREM	2	0.65

NC DWQ Stream Identification Form Version 4.11

06-STR-10

Date: 3/8/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.637970
Evaluator: D. Mitchell	County: Henrico County	Longitude: -77.505878
<b>Total Points:</b> 14.25 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 5)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0		2	3
2. Sinuosity of channel along thalweg	0		2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits		1_	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $5.5$				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	o = 0	Yes:	= 3
C. Biology (Subtotal = $3.75$ )	·	·		
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	0	1	Y	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; O	BL = 1.5 Other = 0	)
*perennial streams may also be identified using other method	ds. See p. 35 of manua			
Notes: Ephemeral channel leading to Stream 6Fig	eld Sheet: 14-A-S	TRM-6.		
	- Hart	-1-11		
Sketch:	Str	eam 6	FLOW	

Stream 6

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
Drainet #		Project Name		wadeable chan	nels classified a Cowardin	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact	
Project #		-		,	Class.			SAR#	length	Factor	
N/A Name	e(s) of Evalua	C2RVA - Area	Stream Nam	VA e and Informa	R2SB ation	02080206	3/8/2016				
	ering and D.	` '				06-S	ΓR-11				
. Channel C	Condition: Asse	ess the cross-sec	tion of the stream	and prevailing c	ondition (erosion,						
	Opti	imal	Subo	ptimal c	onditional Catego	ry ginal	Po	or	Sev	ere	
		W.				less than Severe or stable than Severe	Overwidene Vertically/laterally		1	5	
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse bar	styl little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches re present. Access to their original floodplain or fully developed wide ankfull benches. Mid-channel bars, ankfull benches, and transverse bars few. Transient		or Poor due to Ic Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran instability. Depositi stability, may be AND/OR V-shap	where bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-is covered by diment may be sient, contribute on that contribute to forming/present. ed channels have on on > 40% of the	widen further. Maj are near vertical. E 60-80% of bani protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrit AND/OR V-shape vegetative protecti 40% of the bar	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent 6 60-80% of the dby sediment. orary/transient in uting to instability, db channels have on is present on >	incision, flow cor banks. Streambe rooting depth, n vertical/underc protection present t banks, is not pre Obvious bank sla Erosion/raw ban AND/OR Aggradin than 80% of stream	stability. Severe tained within the ab below average tajority of banks ut. Vegetative on less than 20% of oventing erosion. bughing present. ks on 80-100%. g channel. Greater to bed is covered by		
			Sucam	bottom.	banks and deposit	ional features which to stability.			deposition, contributing to instability. Multiple thread channels and/or subterranean flow.		CI
Score	3	3	2	.4		2	1.	6	1	1.6	
NOTES>>				Fi	eld Sheet:	15-A-STR-0	01.				
2. RIPARIAN	N BUFFERS: A	Assess both bank	s's 100 foot riparia	ın areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt	h may be accep	otable)		
	Opti	imal		ditional Cate		ginal	Po	or	NOTES>>		
Riparian Buffers	Tree stratum (dbh :	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a href="Maintained">Maintained</a> understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
O a madisi a m			High	Low	High	Low	High	Low			
Condition Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
lescriptors. 2. Determine sq pelow.	arian areas along quare footage for e Riparian Area and	each by measurin	g or estimating le	ngth and width. (	Calculators are pr	•	Ensure the of % R	iparian qual 100			
	% Riparian Area>	100% 0.5						100%	-		
Right Bank	Score >	0.5							Cl= (Sum % RA * S	cores*0.01)/2	
	1							4000/	D4 D = 1 C1		
	Score >  % Riparian Area> Score >	100%						100%	Rt Bank CI >	0.50 0.50	0.50
Right Bank  Left Bank  3. INSTREAM	% Riparian Area> Score > W HABITAT: Va	100% 0.5			ody and leafy deb	oris; stable substr	ate; low embeded			0.50	
Right Bank  Left Bank  3. INSTREAN undercut banks;	% Riparian Area> Score > W HABITAT: Va root mats; SAV; r	100% 0.5 aried substrate siffle poole comple	exes, stable featu	res. Conditiona	I Category			ness; shade;	Lt Bank CI >	0.50	
Right Bank  Left Bank  3. INSTREAN undercut banks; Instream Habitat/	% Riparian Area> Score > W HABITAT: Va	100% 0.5 aried substrate siffle poole comple	exes, stable features Subo	res.	I Category Mar	oris; stable substr	ate; low embeded	ness; shade;	Lt Bank CI >	0.50	
Right Bank  Left Bank  3. INSTREAN undercut banks; Instream	% Riparian Area> Score >  M HABITAT: Va root mats; SAV; r	100% 0.5 aried substrate si iffle poole completimal	Subo Stable habitat ele present in 30-509 are adequate fo	res. Conditiona ptimal	Mar Stable habitat ele present in 10-30% are adequate fo	ginal	Po	or listed above are stable. Habitat ally present in less	Lt Bank CI >	0.50	

	St	ream In	npact A	ssessm	ent Fo	m Page	e 2		
Project#	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02080206	3/8/2016	06-STR-11		
	L ALTERATION: Stream cross	sings, riprap, conc	rete, gabions, or	concrete blocks, s	straightening of cl	hannel, channeliz	ation,	NOTES>>	
mbananento, o	poli pilos, deristrictions, ilvestock		Conditiona	I Category					
	Negligible	Mi	nor	Mode	erate	Sev	rere		
Channel Alteration		of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/C shored with ga cerr	y of the channel in the parameter DR 80% of banks bion, riprap, or eent.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH C	ONDITION II	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH	·	
NOTE: The CIs and R	RCI should be rounded to 2 decimal places. T	The CR should be roun	ided to a whole number	er.			THE REACH	CONDITION IND	EX (RCI) >>
							RC	CI= (Sum of all CI's	s)/5
							COMPENSAT	ION REQUIREMI	ENT (CR) >>
							CR = RC	XLFXIF	

INSERT PHOTOS:



Top Left: View of STR-01 south

Top Right: View south from from Culverts 02-03 to CSX

Bottom Left: Two metal 48" CUL-01 and behind 20" concrete CUL-02 to STR-01

Bottom Right: View of culvert carrying STR-01

NC DWQ Stream Identification Form Version 4.11

06-STR-11

Date: 3/8/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.630594
Evaluator: L. Eggering & D. Mitchell	County: Henrico	Longitude: -77.502260
<b>Total Points:</b> 32.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 9	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	(1)	2	3	
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	(0)	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5		1.5	
11. Second or greater order channel	No	0 = 0	Yes = 3		
a artificial ditches are not rated; see discussions in manual	<u>.</u>				
B. Hydrology (Subtotal = $10.5$ )					
12. Presence of Baseflow	0	1	2	(3)	

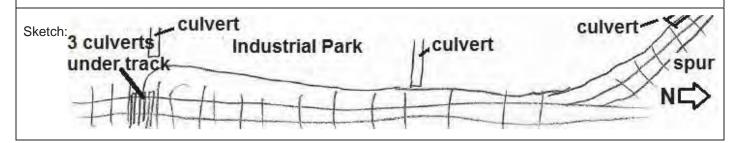
12. Presence of Baseflow	0	1	2	(3)	
13. Iron oxidizing bacteria	0	1	2	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5		1.5	
16. Organic debris lines or piles	0	0.5		1.5	
17. Soil-based evidence of high water table?	N	lo = 0	Yes = 3		
0.51.1					

C	Biology	(Subtotal =	13
Ο.	Didiogy	(Subtotal –	

18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.76:	OBL = 1.5 Other = 0	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Very slow flow, poor quality, drains industrial area. Field Sheet: 15-A-STRM-1.



		Stre		SSESS			n (For	m 1)			
Dunit 11 "		Duningt No.		wadeable chan	nels classified a			045 "	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A Nam	e(s) of Evaluation	2RVA - Area		VA e and Informa	R2SB4	02080206	3/9/2016				
	chell & L. Eg	. ,	Stream Nam	e and inform	ation	06-5	ΓR-12				
	Condition: Asse		tion of the stream	and prevailing c	ondition (erosion		111 12				
	Opti				Conditional Catego		Po	or	Sev	roro.	
	У	IIIai	Jubo	ptimai	Iviai	giriai	N.	OI	Jev		
	ition  urface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid changel ben full benches (180-100). It is a second to the following the control of the following		Poor. Banks more	less than Severe or stable than Severe		unstable. Likely to	Deeply incised	(or excavated).			
Channel Condition			table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow ll defined. Stream to bankfull benches, d floodplains along	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strear sediment. Se temporary/tran instability. Depositi	ower bank slopes, eseent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to	60-80% of bank protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib	rosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank skl. Erosion/raw ban	stability. Severe tained within the ed below average hajority of banks ut. Vegetative on less than 20% of venting erosion. Dughing present. ks on 80-100%.		
	sediment depositio	nsverse bars few. Transient t deposition covers less than 10% of bottom.		stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.		AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.		AND/OR Aggrading channel Greater		CI	
Score	3	3	2	.4		2	1.	6	1	1	2.4
NOTES>>				Fi	eld Sheet:	15-A-STRN	12.				
DIDADIAN	N DUEEEDS: 4	\ h-th h-ul	d= 400 f= =t =i= ==i=		- antina CAD. (an				4-bl-)		
. KII AKIAI	T DOTT LING.	155655 DUIII Daiii	is 100 loot lipalla				to of longth & widt	h may be seen			
	Conditional Cate		Con			ugn measuremen	its of length & widt	th may be accep			
	Opti	mal		ditional Cate	gory	ginal	ts of length & widt		NOTES>>		
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate	gory		High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable		NOTES>>		
Buffers	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the	• 3 inches) present, anopy cower and a derstory. Wetlands e riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/4">https://doi.org/10.100/j.nc/4</a> High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>		
	Tree stratum (dbh > with > 60% tree ca	• 3 inches) present, anopy cower and a derstory. Wetlands e riparian areas.	Suboj  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.	NOTES>>		
Condition Scores  1. Delineate ripz descriptors. 2. Determine scopelow.	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the	3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban ach by measurin	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both oherbaceos and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  ondition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>>		
Condition Scores  Delineate ripi lescriptors. Determine scorelow.	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located l	3 inches) present, anopy cover and a destroiry. Wetlands e riparian areas.  5  each stream ban ach by measurin Score for each r 70%	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 30%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  ondition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- more acceptable of the condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>>		
Condition Scores  Delineate ripelescriptors. Determine scielow. Enter the % F	Tree stratum (dbh ) with > 60% tree canon-maintained und located within the located withi	- 3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban ach by measurin	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  ondition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- more acceptable of the condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>>	cores*0.01)/2	
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % F	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	5 sach stream ban ach by measurin 70% 1.5 100%	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 30%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  ondition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- more acceptable of the condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	1.20	CI
Condition Scores  Delineate rips descriptors. Descriptors. Enter the % I Right Bank  Left Bank	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	5  each stream ban ach by measurin Score for each r 70% 1.5	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both chraceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 30% 0.5	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >		CI 1.35
Condition Scores  Delineate ripe descriptors. Descriptors	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	5  sach stream ban ach by measurin 70% 1.5 100% 1.5 aried substrate si	Subor  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 30% 0.5	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	1.20	
Condition Scores  1. Delineate ripe descriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	5  sach stream ban sach by measurin T0% 1.5  100% 1.5  aried substrate siffle poole comple	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in 30%  0.5	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- more and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 10.5  L	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.20	
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % F Right Bank  Left Bank  3. INSTREAL undercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	5  sach stream ban ach by measurin 70% 1.5  100% 1.5  aried substrate siffle poole completimal	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbacleus and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 30% 0.5  Zes, water velocit exes, stable featur  Subol Stable habitat elei	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below the product of the blocks below the product	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  W.  In Category  Mar  Stable habitat ele	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks end Blocks e	Low Poor: Impervious surfaces, mine spoil fands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  ne sums iparian qual 100 100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	1.20	
Condition Scores  Delineate rips descriptors. Ender the % I Right Bank  Left Bank  Left Bank  Instream	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	5  sach stream ban ach by measurin 70% 1.5  100% 1.5  aried substrate siffle poole completimal re typically present	Suboy  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both ontaining ional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Tategories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrul layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High 0.85  Calculators are provided in the control of the c	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	CI= (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>>	1.20		

	St	ream In	npact A	ssessm	ent For	rm Pag	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB4	02080206	3/9/2016	06-STR-12		
b. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, mbankments, spoil piles, constrictions, livestock  Conditional Category									
	Negligible	nor	Moderate		Severe				
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than to disrupted by an alterations listed guidelines AND/to shored with ga	30% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or nent.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5	]	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View of stream

Top Right: Confluence of STR-02 (left)
and STR-03 (right)

Bottom Left: Stormwater manhole in
stream

NC DWO Stream Identification Form Version 4.11

06-STR-12

Date: 3/9/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.624819
Evaluator: L. Eggering & D. Mitchell	County: Henrico	Longitude: -77.500272
Total Points: 40 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

:: = : = :: = : = : = : = : = : = : = :	_			
	_	100		
A. Geomorphology (Subtotal = 18.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	$\bigcirc$	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	(3)
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $10.5$ )				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15 Codiment on plants or debris	0	0.5	1	1.5

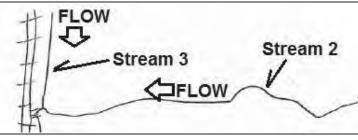
15. Sediment on plants or debris 1.5 16. Organic debris lines or piles 0 0.5 1.5 17. Soil-based evidence of high water table? No = 0Yes = 3

C. Biology (Subtotal = 11 18. Fibrous roots in streambed 0 2 19. Rooted upland plants in streambed 3 1 20. Macrobenthos (note diversity and abundance) 2 3 0 2 21. Aquatic Mollusks 1 22. Fish 1.5 0.5 23. Crayfish 0 0.5 1.5 24. Amphibians 0 0.5 1.5 25. Algae 0.5 0 1.5 26. Wetland plants in streambed FACW = 0.75; OBL = 1.5 Other = 0

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Wetland 1 abuts. Flows under track at Culvert 8. Sandy bottom stream. Average 20' wide bankfull. Field Sheet: 15-A-STRM-2.

Sketch:



		Stre					(For	m 1)			
				fied Stream N wadeable chan							
Project #		Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	06	VA	R2SB	02080206	3/9/2016				
Name	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
D. Mito	chell & L. Eg	gering				06-S	ΓR-13				
. Channel C	Condition: Asse	ess the cross-sec	ction of the stream								
	Ont	imal	Subo	ptimal	onditional Category  Marginal		Poor		Sev	ere	
	Very little incision or active erosion; 80- 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transprace bars four Transions.			1	less than Severe or	130		1	5		
Channel Condition			erosion or unproter of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to or newly develope portions of the r	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient	Poor. Banks more or Poor due to Ic Erosion may be pr both banks. Vegei 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositis stability, may be	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may rorut. AND/OR 40- on is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/Of stream is covere Sediment is temp nature, and contrit AND/OR V-shape	unstable. Likely to ority of both banks rosion present on ros. Vegetative nt on 20-40% of fficient to prevent & 60-80% of the ed by sediment. orary/transient in unting to instability. dd channels have	vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sle Erosion/raw ban AND/OR Aggradin;	stability. Severe tained within the do below average lajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%.	
	10% of	bottom.	sediment covers 10-40% of the stream bottom.		AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.				than 80% of stream deposition, contrib Multiple thread of subterran	С	
Score	;	3	2	.4	2	2	1.	6	1		1.6
NOTES>>				Fie	eld Sheet: '	15-A-STRM	-3.				
. RIPARIAN	N BUFFERS: /	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	h may be accep	otable)		
. RIPARIAN			Con	ditional Cate	gory				notable)		
Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cr	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	*	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Or  Low Poor:	NOTES>> Right bank ballast. Lef has some v then paven	t bank /egetation	
Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cr	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> Right bank ballast. Lef has some v then paven	t bank /egetation	
Riparian Buffers	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Right bank ballast. Lef has some v then paven	t bank /egetation	
Riparian Buffers  Condition Scores  Delineate ripa escriptors. Determine so elow.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strain areas along quare footage for exparain Area and	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Right bank ballast. Lef has some v then paven	t bank /egetation	
Riparian Buffers  Condition Scores  Delineate ripa escriptors. Determine so elow.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strain areas along quare footage for exparian Area and % Riparian Area>	imal  > 3 inches) present, anopy cover and a destory. Wetlands e riparian areas.  .5  each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Right bank ballast. Lef has some v then paven	t bank /egetation	
Riparian Buffers  Condition Scores  Delineate ripa elow. Enter the % F	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strain areas along quare footage for exparain Area and	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Right bank ballast. Lef has some v then paven	t bank vegetation nent.	
Riparian Buffers  Condition Scores  Delineate ripa escriptors. Determine squelow. Enter the % F. Right Bank	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strain areas along quare footage for exparian Area and % Riparian Area>	imal  > 3 inches) present, anopy cover and a destory. Wetlands e riparian areas.  .5  each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Right bank ballast. Lef has some v then paven	t bank vegetation nent.	CI
Riparian Buffers  Condition Scores  Delineate ripa elow. Enter the % F	Tree stratum (dbh: with > 60% tree cz non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri 10% 1.1	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 90% 0.5	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are processed.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	NOTES>> Right bank ballast. Lef has some v then paven	t bank regetation nent.	CI 0.6
Riparian Buffers  Condition Scores  Delineate ripa escriptors. Determine squelow. Enter the % F Right Bank  Left Bank  INSTREAN	Tree stratum (dbh: with > 60% tree canon-maintained un located within th  1. arian areas along: uare footage for e Riparian Area and % Riparian Area> \$\$Core >\$\$	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 10% 1.1 30% 1.1 aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le sparian category in 90% 0.5  70% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (In the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Academic Scores us Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Right bank ballast. Lef has some v then paven  Cl= (Sum % RA*S Rt Bank CI>	t bank regetation nent.	
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine squelow. Enter the % F Right Bank  Left Bank  B. INSTREAN ndercut banks; Instream	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 10% 1.1 30% 1.1 aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 90% 0.5  70% 0.5  zes, water velocit exes, stable featu	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the control of the con	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you  pris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Right bank ballast. Lef has some withen paven  Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl>	t bank regetation nent.	
Riparian Buffers  Condition Scores  Delineate ripa escriptors. Determine squelow. Enter the % F Right Bank  Left Bank  INSTREAN	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5  each stream ban each by measurin 10% 1.1  30% 1.1  aried substrate si iffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 90% 0.5  70% 0.5  Izes, water velocit exes, stable featu Subo  Stable habitat ele present in 30-50% are adequate fo	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Right bank ballast. Lef has some v then paven  Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl> NOTES>>	t bank regetation nent.	

	St	ream In	npact A	ssessm	ent For	rm Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	csx		VA	R2SB	02080206	3/9/2016	06-STR-13		
	CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization,  Ankments, spoil piles, constrictions, livestock  Conditional Category  Negligible  Minor  Moderate  Severe  NOTES>>  Stream appears to be channelized ditch								
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	30% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or	along rail. built to accommod adjacent in land use.	late
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5	1	
	DEACH C	ONDITION II	NDEV and S	TDEAM COM	UDITION LIN	ITS EAD TH	IIS DEVCH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Confluence of STR-02 (left) and STR-03 (right)

Top Right: Typical view of stream along tracks, location where stream turns southwest Bottom Left: Typical view of stream, looking south Bottom Right: Typical view of stream

NC DWQ Stream Identification Form Version 4.11

06-STR-13

Date: 3/9/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.624927
Evaluator: L. Eggering & D. Mitchell	County: Henrico	Longitude: -77.499871
Total Points: 32 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

0 0 0 0 0 0 0 0 0 0	1 1 1 1 1 0.5 0.5	2 2 2 2 2 2 2 2 2 1 1 Yes =	3 3 3 3 3 3 3 1.5 1.5
0 0 0 0 0 0 0 0 0 0 0	1 1 1 1 0.5 0.5 0 = 0	2 2 2 2 2 2 2 2 1	3 3 3 3 3 3 1.5
0 0 0 0 0 0 0 0 No	1 1 1 0.5 0.5 0 = 0	2 2 2 2 2 2	3 3 3 3 1.5 1.5
0 0 0 0 0 0 0 0 No	1 1 1 0.5 0.5 0 = 0	2 2 2 2 2 2	3 3 3 3 1.5 1.5
0 0 0 0 0 0 No	0.5 0.5 0 = 0	2 2 2 2 1	3 3 3 3 1.5
0 0 0 0 0 No	0.5 0.5 0 = 0	2 2 2 1 1	3 3 3 1.5 1.5
0 0 0 0 0 No	0.5 0.5 0 = 0	2 2 1 1	3 3 1.5 1.5
0 0 0 No	0.5 0.5 0 = 0	2	3 1.5 1.5
0 0 No	0.5	1	1.5 1.5
0 No	0.5	1	1.5
0	0 = 0		
0		Yes =	= 3
0	1	2	(3)
U		2	3
1.5	<b>(1)</b>	0.5	0
			1.5
-			1.5
No			
3	(2)	1	0
3	(2)	1	0
0	1	2	(3)
0	1	2	3
0	0.5	1	1.5
0			1.5
0		$\overline{}$	1.5
		1	1.5
		OBL = 1.5 Other = 0	
ee p. 35 of manua			
•		Field Sheet: 15-A-9	STRM-3.
- F 10			
111	4111	N <	
+++	111	1-1-1-1	
	I I toler	1	
	-1		
Strea	m 3. <	FLOW	
m 2			
	0 0 No 3 3 3 0 0 0 0 0 0 0 0 0 ee p. 35 of manuar (~3-5') & is 1	0 0.5 0 0.5 No = 0  3 2 3 2 0 1 0 1 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5 FACW = 0.75; 0 ee p. 35 of manual. (~3-5') & is 15' bankfull width.	0 0.5 1 0 0.5 1 No = 0 Yes =  3 2 1 3 2 1 0 1 2 0 1 2 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 FACW = 0.75; OBL = 1.5 Other = 0 ee p. 35 of manual. (~3-5') & is 15' bankfull width. Field Sheet: 15-A-S

### **Ephemeral Stream Assessment Form (Form 1a)**

Unified Stream Methodology for use in Virginia

For use in ephemeral streams

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Area 06	VA	R6	02080206	3/9/2016			

Name(s) of Evaluator(s) Stream Name and Information

D. Mitchell & L. Eggering 06-STR-14

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Con	ditional Cate	gory				NOTES>>		
	Optimal	Subo	ptimal	Mar	ginal	Po	oor	15-STR-05		
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.				
		High	Low	High	Low	High	Low			
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5			
Delineate ripa	arian areas along each stream bank	into Condition Ca	tegories and Con	dition Scores usir	ng the descriptors.	Ensure	the sums			
2. Determine sq pelow.	uare footage for each by measuring	or estimating len	gth and width. Ca	alculators are prov	vided for you	of % F	Riparian			
3. Enter the % F	Riparian Area and Score for each rip	parian category in	the blocks below.			Blocks e	equal 100			
Right Bank	% Riparian Area> 40%	60%					100%	]		
RIGHT Dalik	Score > 0.6	0.75								
·								CI= (Sum % RA * \$	Scores*0.01)/2	
Left Bank	% Riparian Area> 40%	60%					100%	Rt Bank CI >	0.69	
Leit Dalik	Score > 0.6	0.5						Lt Bank CI >	0.54	0

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.31

0

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

**INSERT PHOTOS:** 



Left: Typical view fo stream adjacent tracks

Right: View of culvert carying the stream under the railroad

NC DWQ Stream Identification Form Version 4.11

06-STR-14

Date: 3/9/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.624037
Evaluator: L. Eggering & D. Mitchell	County: Henrico	Longitude: -77.499034
Total Points: 13 Stream is at least intermittent if ≥ 19 or perennial if ≥ $30^*$	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 5)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	۵	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $3$				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
C. Biology (Subtotal = 5				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other methods	s. See p. 35 of manua	ıl.		
Notes: Field Sheet: 15-A-STRM-5.				
Sketch:  FLOW Stream 5		spur	□N	

		Stre	Uni	fied Stream M	lethodology f	for use in Virg		m 1)			
		- · · · · · · N			nels classified a	s intermittent or		215 "	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R4SB3	02080206	3/9/2016				
	e(s) of Evaluat chell & L. Egg	` '	Stream Nam	e and Informa	ation	06-87	ΓR-15				
	Condition: Asse		ation of the atroom	and provailing a	andition (aronian		1117-13				
i. Onamier C				C	Conditional Catego	ry	D-		0		
	Opti	mai	Subo	ptimal	Iviar	ginal	Po	or	Sev	ere	
	market and the second	AND SHAPE	Slightly incised, for	ew areas of active	Poor. Banks more	less than Severe or		unstable. Likely to	Deeply incised	(or excavated).	
Channel Condition	Very little incision or 100% stable ban surface protection prominent (80-10 Stable point bars% are present. Acces floodplain or fully bankfull benches. I and transverse ba	nks. Vegetative n or natural rock, 20%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars, ars few. Transient	of banks are s Vegetative protect prominent (60 Depositional feat stability. The bar channels are we likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strear sediment. Se temporary/tran instability. Depositi	ower bank slopes, resent on 40-60% of tative protection on . Streambanks may ercut. AND/OR 40- n is covered by diment may be usient, contribute foon that contribute to the forming/present.	60-80% of ban protection prese banks, and is insu erosion. AND/OI stream is covere Sediment is temp	rosion present on ks. Vegetative nt on 20-40% of ffficient to prevent R 60-80% of the ed by sediment. corary/transient in buting to instability.	vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank skl. Erosion/raw ban	stability. Severe tained within the ed below average hajority of banks ut. Vegetative on less than 20% of eventing erosion. Dughing present. ks on 80-100%.	
	sediment deposition 10% of b		sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protect banks and deposit	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar	on is present on > nks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	CI
Score	3	}	2	.4		2	1.	6	1		1.6
NOTES>>				Fie	eld Sheet:	15-A-STRM	-4.				
2. RIPARIAI	N BUFFERS: A	ssess both bank	de 100 foot riparie								
			s 100 loot lipalla	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	th may be accep	table)		
				ditional Cate		ugh measuremen	ts of length & wide	th may be accep	NOTES>>		
	Opti		Con		gory	ginal	ts of length & wid				
Riparian Buffers	Optia  Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a lerstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Cginal  Low Marginal: Non-maintained, dense herbaceous vegetation,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.		NOTES>>		
Buffers	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a letrestory. Wellands a riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/4">https://doi.org/10.100/j.nc/4</a> High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ir riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>		
	Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a letrestory. Wellands a riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>		
Condition Scores  1. Delineate ripiescriptors. 2. Determine so	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a lerstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  ondition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, iriparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>		
Condition Scores  1. Delineate ripiescriptors. 2. Determine scoelow.	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	mal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  ondition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, iriparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>		
Condition Scores  1. Delineate rip: descriptors. 2. Determine scoelow. 3. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the strain areas along equare footage for earlian Area and % Riparian Area >	mal  3 inches) present, nopy cover and a leterstory. Wetlands in partial areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  ondition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, iriparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums iparian qual 100 100%	NOTES>>		
Condition Scores  1. Delineate rip: descriptors. 2. Determine scoelow. 3. Enter the % I	Tree stratum (dbh > with > 60% tree ca a non-maintained und located within the located wi	mal  3 inches) present, nopy cover and a leterstory. Wetlands eriparian areas.  5  beach stream ban ach by measurin Score for each r 100% 0.5  100%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  ondition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, iriparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >	0.50	CI
Condition Scores  Delineate rip descriptors. Enderwine scoolew. Can Be and the score of the scor	Tree stratum (dbh > with > 60% tree ca anon-maintained und located within the located wit	mal  3 inches) present, nopy cover and a letrestory. Weltlands a riparian areas.  5  beach stream ban ach by measurin Score for each r 100% 0.5  100% 0.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >		C1 0.50
Condition Scores  1. Delineate ripidescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh > with > 60% tree ca a non-maintained und located within the located wi	mal  3 inches) present, nopy cover and a lerstory. Wetlands riparian areas.  5  each stream ban ach by measurin  Score for each r  100%  0.5  100%  0.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dth > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >	0.50	
Condition Scores  Delineate ripidescriptors. Ender the % I Right Bank  Left Bank  Left Bank  Instream	Tree stratum (dbh > with > 60% tree ca a non-maintained und located within the located wi	mal  3 inches) present, nopy cover and a leterstory. Wetlands riparian areas.  5  5  5  6  6  7  8  8  8  8  8  8  8  9  100%  0.5  100%  0.5  100%  0.5  100%  0.5	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	0.50	
Condition Scores  1. Delineate rip. descriptors. 2. Determine scoledw. 3. Enter the % I Right Bank Left Bank  1. Left Bank 1. Left Bank 1. Left Bank 1. Left Bank 1. Left Bank 1. Left Bank 1. Left Bank 1. Left Bank	Tree stratum (dbh > with > 60% tree ca a non-maintained und located within the located wi	mal  3 inches) present, nopy cover and a leterstory. Wetlands riparian areas.  5  beach stream ban ach by measurin Score for each r 100% 0.5  100% 0.5  aried substrate siffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) posent with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in interpretation of the containing service in the containing serv	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  W.  In Category  Mar  Stable habitat ele	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-more and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks each and stabilized	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >  Lt Bank Cl >	0.50	
Condition Scores  1. Delineate ripi descriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	mal  3 inches) present, nopy cover and a leterstory. Wetlands riparian areas.  5  sach stream ban ach by measuring 100% 0.5  100% 0.5  aried substrate signed s	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in  in a category in  sees, stable featu  Subo  Stable habitat ele present in 30-50% are adequate fo	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the properties of the blocks below the	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrul layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High 0.85  Calculators are provided in the control of the c	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, iriparian areas lacking shrub and tree stratum, hony production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the rovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to discuss the seeded and stabilized or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  The sums iparian qual 100 100%  100%  Ilisted above are stable. Habitat lily present in less	CI= (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>>	0.50	

Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB3	02080206	3/9/2016	06-STR-15		
	ALTERATION: Stream cross poil piles, constrictions, livestock	sings, riprap, cond		concrete blocks,	straightening of ch	nannel, channeliz	zation,	NOTES>>	
	Negligible	Mi	nor	Moderate		Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0 shored with ga	30% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or nent.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

### INSERT PHOTOS:





Top Left: View of culverts carying stream under railroad Top Right: View north of stream through culverts adjacent railroad Bottom Left: Typical view of stream east of tracks

NC DWQ Stream Identification Form Version 4.11

06-STR-15

3

1.5

1.5

2

1

Yes = 3

Date: 3/9/2016	Project/Site: DC	2RVA - Area 06	Latitude: 37.6	Latitude: 37.614922		
Evaluator: L. Eggering & D. Mitchell	County: Henrico	)	Longitude: -77	7.494885		
<b>Total Points:</b> 24.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:			
A. Geomorphology (Subtotal = 8)	Absent	Weak	Moderate	Strong		
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3		
2. Sinuosity of channel along thalweg	0	(1)	2	3		
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3		
4. Particle size of stream substrate	0	(1)	2	3		
5. Active/relict floodplain		1	2	3		
6. Depositional bars or benches	(0)	1	2	3		
7. Recent alluvial deposits	0	1	2	3		

a artificial ditches are not rated; see discussions in manual

11. Second or greater order channel

12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	o = 0	Yes	= 3

0

No = 0

C. Biology (Subtotal = 7.5

8. Headcuts

9. Grade control

10. Natural valley

/				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75	OBL = 1.5 Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet: 15-A-STRM-4.

Sketch:

N Culvert 11 FLOW 6 culverts

Staples Mill
Amtrak Station Small Bridge 11111 5 culverts

### **Ephemeral Stream Assessment Form (Form 1a)**

Unified Stream Methodology for use in Virginia

For use in ephemeral streams

Project #	Project Name	Locality	Cowardin Class.	нис	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Area 06	VA	R6	02080206	3/9/2016			

Name(s) of Evaluator(s) Stream Name and Information

D. Mitchell & L. Eggering 06-STR-16

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Con	ditional Cate	gory				NOTES>>			
	Optimal	Subo	ptimal	Mar	ginal	Po	oor	Field Shee	Field Sheet: 15-A-		
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, recently seeded and stabilized, or other comparable condition.		Field Sheet: 15-A- STRM-6.			
		High	Low	High	Low	High	Low				
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5				
Delineate ripa	arian areas along each stream bank	into Condition Ca	tegories and Con	dition Scores usir	ng the descriptors.	Ensure	the sums				
2. Determine sq pelow.	uare footage for each by measuring	or estimating len	gth and width. Ca	alculators are prov	vided for you	of % F	Riparian				
3. Enter the % F	Riparian Area and Score for each rip	parian category in	the blocks below.			Blocks e	equal 100				
Right Bank	% Riparian Area> 80%	20%					100%				
RIGHT Dalik	Score > 0.6	0.5									
								CI= (Sum % RA * \$	Scores*0.01)/2		
Left Bank	% Riparian Area> 70%	30%					100%	Rt Bank CI >	0.58	(	
Leit Dalik	Score > 0.5	0.6						Lt Bank CI >	0.53	0.	

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> 0.28

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:



Left: View upstream toward culvert under Hilliard Road Right: View downstream toward culvert under Hilliard Road

NC DWQ Stream Identification Form Version 4.11

06-STR-16

1.5

1.5

1.5

1

FACW = 0.75; OBL = 1.5 other = 0

0.5

Date: 3/9/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.614202
Evaluator: L. Eggering & D. Mitchell	County: Henrico	Longitude: -77.494488
Total Points: 17 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral ntermittent Perennial	Other e.g. Quad Name:

if $\geq$ 19 or perennial if $\geq$ 30*	Epnemeral	e.g. Quad Name:	<u> </u>			
A. Geomorphology (Subtotal = 4.5	Absent	Weak	Moderate	Strong		
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3		
Sinuosity of channel along thalweg	0	(1)	2	3		
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3		
Particle size of stream substrate	0	1	2	3		
5. Active/relict floodplain	(2)	1	2	3		
6. Depositional bars or benches	0	1	2	3		
7. Recent alluvial deposits	0	1	2	3		
8. Headcuts	0	1	2	3		
9. Grade control	0	0.5	1	1.5		
10. Natural valley	0	0.5	1	1.5		
11. Second or greater order channel		0 = 0	Yes	Yes = 3		
<sup>a</sup> artificial ditches are not rated; see discussions in manual						
B. Hydrology (Subtotal = $5.5$						
12. Presence of Baseflow	0	(1)	2	3		
13. Iron oxidizing bacteria	0	(1)	2	3		
14. Leaf litter	1.5	1	0.5	0		
15. Sediment on plants or debris	0	0.5	1	1.5		
16. Organic debris lines or piles	0	0.5	1	1.5		
17. Soil-based evidence of high water table?	No	0 = 0	Yes	Yes = 3		
C. Biology (Subtotal = $\frac{7}{}$ )			$\sim$			
18. Fibrous roots in streambed	3	2	(1)	0		
19. Rooted upland plants in streambed	3	2		0		
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3		
21. Aquatic Mollusks	(0)	1	2	3		
22. Fish	0	0.5	1	1.5		

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet: 15-A-STRM-6.

26. Wetland plants in streambed

23. Crayfish

25. Algae

24. Amphibians

Sketch:

| Sketch: | Stream 6 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | Stream 5 | S

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Impact/SAR Impact Cowardin Project # **Project Name** Locality HUC Date SAR# Class length **Factor** N/A DC2RVA - Area 06 02080206 3/9/2016 Stream Name and Information Name(s) of Evaluator(s) D. Mitchell & L. Eggering 06-STR-17 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** Optimal Suboptimal Marginal Field Sheet: 15-A-Low Marginal: Non-maintained, High Poor: Lawns, mowed STRM-7. ligh Suboptima High Marginal: Riparian areas ense herbaceou Riparian areas and maintained Low Poor: vegetation, riparian areas with tree stratur Non-maintained with tree stratum (dbh > 3 inches) reas, nurseries (dbh > 3 inches) present, with ense herhaceou no-till cropland vegetation with either a shrub acking shrub and Free stratum (dbh > 3 inches) presen spoil lands, resent, with 30% to 60% tree actively grazed Riparian 30% tree canon tree stratum, hav pasture, sparsely vegetated non-maintained area, with > 60% tree canopy cover and ar enuded surface cover and a maintained roduction, ponds open water. If laver or a tree canopy cover an containing both row crops, active eed lots, trails, or **Buffers** on-maintained understory. Wetland layer (dbh > 3 inches) present, understory present, tree herbaceous and recently seeded ther comparable Recent cutove with <30% tree stratum (dbh >3 shrub layers or a non-maintained and stabilized, o conditions. (dense vegetation). canopy cover. inches) present, with <30% tree understory canopy cover with maintained High High Low High Low Low Condition 1.5 1.2 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 30% 70% 100%

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

0.75

80%

0.75

0.5

20%

0.5

THE REACH CONDITION INDEX (RCI) >> 0.35 RCI= (Riparian CI)/2

Rt Bank CI >

Lt Bank CI >

100%

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

CI= (Sum % RA \* Scores\*0.01)/2

0.68

0.70

CI

0.69

0

INSERT PHOTOS:

Right Bank

Left Bank

% Riparian Area>

% Riparian Area>

Score >



Typical stream view

NC DWQ Stream Identification Form Version 4.11

06-STR-17

Date: 3/9/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.600523
Evaluator: L. Eggering & D. Mitchell	County: Henrico	Longitude: -77.488134
<b>Total Points:</b> 17 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 7)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	<b>@</b>	1	2	3
6. Depositional bars or benches	0)	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1)	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 6.5				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes	= 3
C. Biology (Subtotal = 3.5				
18. Fibrous roots in streambed	3	2	1)	0
19. Rooted upland plants in streambed	3	2		0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other methods	. See p. 35 of manua	al.		
Notes: Field Sheet: 15-A-STRM-7.				
Water Co. Company and Co.	_OW⊏>	Rd		
1-1-1-1-1			`	

		Stre		fied Stream M	lethodology f	or use in Virg	ginia	m 1)			
Project #		Project Name		Locality	nels classified a Cowardin Class.	HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Area 06		VA	R2SB	02080206	3/9/2016		iongui	7 4000		
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
D. Mit	chell & L. Eg	gering			06-S	TR-18 (	Upham B	rook)			
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Optimal		Subo	ptimal	onditional Catego Mar	ry ginal	Po	or	Sev	ere	
		AND PARK	1			less than Severe or	Overwiden		1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or full) bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are stogetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to rewly develope	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, of floodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may errut. AND/OR 40- n is covered by diment may be sisent, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks frosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. iorary/transient in puting to instability.	vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Frision/raw banks on 80-100%.		
	sediment deposition 10% of	on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depos	nks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	С
Score		3	2	4	:	2	1.	6	1		2.0
2. RIPARIAI	N BUFFERS: /	Assess both bank	Con	an areas along the ditional Cate ptimal	gory	ugh measuremen	ts of length & wid		table)		
2. RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, addrestory. Wetlands	Con	ditional Cate	gory						
Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cr. non-maintained un	imal  > 3 inches) present, addrestory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, addrestory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or of other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 20%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %	Tree stratum (dbh: with > 60% tree conon-maintained un located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating leparian category in	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5 he sums iparian qual 100		cores*0.01)/2	
Condition Scores  Delineate rip descriptors. Delow. Enter the % Right Bank	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each ri  80%  1.2	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 20%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5 he sums iparian qual 100	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	1.06	CI
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  M Riparian Area> Score >	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each ri  80%  1.2  100%  1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>		CI 1.1:
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the %  Right Bank  Left Bank  3. INSTREAl undercut banks;	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each ri  80%  1.2  100%  1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provinced to the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.06	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each ri  80%  1.2  100%  1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.5	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicate the control of the cont	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.06	
Condition Scores  Delineate rip descriptors. Enter the % Right Bank  Left Bank  Left Bank  INSTREAl undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree conon-maintained un located within th  1.  arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> root mats; SAV; r  Opti Habitat elements a	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin 80% 1.2 100% 1.2 aried substrate si iffle poole completimal re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.5	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically & of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks ended to the blocks ended	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.06	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi. root mats; SAV; r  Opti Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin 80% 1.2 100% 1.2 aried substrate si iffle poole completimal re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below ty and depths; wo res.  Conditional ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to f % R Blocks end	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  the sums iparian qual 100 100%  100%  or ilisted above are stable. Habitat ally present in less t the reach.	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.06	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor N/A R2SB 02080206 3/9/2016 06-STR-18 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 60 - 80% of reac 40 - 60% of read s disrupted by any of the channel alterations listed in s disrupted by an of the channel Less than 20% of 20-40% of the Iterations listed i Greater than 80% of reach is Channel the stream reach stream reach is the parameter guidelines. If stream has been the parameter guidelines. If stream has been disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. disrupted by any of the channel lterations listed in srupted by any o the channel Alteration terations listed in channelized, channelized, shored with gabion, riprap, or the parameter guidelines. the parameter guidelines. normal stable stream meander pattern has not normal stable stream meander cement. pattern has not recovered. recovered. CI SCORE 1.5 1.3 1.1 0.5 0.90 0.9 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 dec

RCI= (Sum of all Cl's)/5
COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0





Top Left: Typical view of stream from railroad Top Right: Typical view of stream from culvert under railroad Bottom Left: View of culvert carrying stream under railroad

NC DWQ Stream Identification Form Version 4.11 Upham Brook 06-STR-18

110 2 11 & 201 00000 1000000000000000000		
Date: 3/9/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.599252
Evaluator: L. Eggering & D. Mitchell	County: Henrico	Longitude: -77.487071
<b>Total Points:</b> 39.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*	Epitemeral intermitter Ferenman e.g. Quad Name.						
A. Geomorphology (Subtotal = 16.5	Absent	Weak	Moderate	Strong			
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3			
Sinuosity of channel along thalweg	0	(1)	2	3			
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3			
4. Particle size of stream substrate	0	(1)	2	3			
5. Active/relict floodplain	0	1	2	3			
6. Depositional bars or benches	0	1	2	3			
7. Recent alluvial deposits	0	1	8	3			
8. Headcuts	0	1	2	3			
9. Grade control	0	0.5	1	1.5			
10. Natural valley	0	0.5	1	1.5			
11. Second or greater order channel	No	0 = 0	Yes	= 3			
<sup>a</sup> artificial ditches are not rated; see discussions in manual  B. Hydrology (Subtotal = 10 )							
12. Presence of Baseflow	0	1	2	(3)			
13. Iron oxidizing bacteria	0	(1)	2	3			
14. Leaf litter	1.5	1	0.5	0			
15. Sediment on plants or debris	0	0.5	1	1.5			
16. Organic debris lines or piles	0	0.5		1.5			
17. Soil-based evidence of high water table?	No	0 = 0	Yes	Yes = 3			
C. Biology (Subtotal = <u>13</u> )							
18. Fibrous roots in streambed	3	2	1	0			
19. Rooted upland plants in streambed	3	2	1	0			
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3			
21. Aquatic Mollusks	0	(1)	2	3			
22. Fish	0	0.5	1	1.5			
23. Crayfish	0	0.5		1.5			

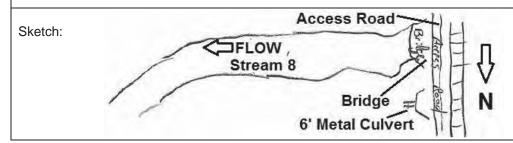
\*perennial streams may also be identified using other methods. See p. 35 of manual.

24. Amphibians

26. Wetland plants in streambed

25. Algae

Notes: Larger perennial stream. Stream 30' wide; 2-5' deep. Field Sheet: 15-A-STRM-8.



0

0

0.5

0.5

FACW = 0.75; OBL = 1.5 Other = 0

1.5

1.5

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
		5 · · · · · · ·		wadeable chan	nels classified a			242 "	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R4SB3	02080206	3/9/2016				
	e(s) of Evalua chell & L. Eg	` '	Stream Nam	e and Informa	ation	06-87	ΓR-19				
	Condition: Asse		tion of the stream	and prevailing of	andition (erasion		111-13				
. Onamici c				C	Conditional Catego	ry	D.		Con		
	Opti	ımaı	Subo	ptimal	Iviar	ginal	Po	or	Sev	ere	
		AND PARK	Slightly incised, fu	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		Deeply incised	(or excavated)	
Channel Condition	Very little incision o 100% stable bai surface protectio prominent (80-1 Stable point bars' are present. Acce floodplain or fully bankfull benches. and transverse be	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	cted banks. Majority table (60-80%). titon or natural rock-80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, dd floodplains along reach. Transient	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Majo are near vertical. E 60-80% of banh protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	rosion present on ks. Vegetative nt on 20-40% of fficient to prevent & 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in: incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank slo Erosion/raw ban	stability. Severe tained within the do below average tajority of banks ut. Vegetative in less than 20% of venting erosion. Sughing present. It is on 80-100%.	
	sediment deposition 10% of	on covers less than bottom.	sediment cover	reach. Transient rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the barn sediment depos	on is present on > iks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	4		2	1.	6	1		2.0
NOTES>>				Fie	eld Sheet:	15-A-STRM	-9.				
DIDADIA	N BULLEBO.		l. 400 feet in its		0AD (1)	.1					
. RIPARIAN	N BUFFERS: A	Assess both bank				ugh measuremen	ts of length & widt	h may be accep			
. RIPARIAI	N BUFFERS: A		Con	an areas along the ditional Cateo ptimal	gory	ugh measuremen	ts of length & widt		table)		
Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained					
Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti Tree stratum (dbh : with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wellands deriparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active fee lots, trails, or or other comparable conditions.			
Riparian Buffers  Condition Scores  Delineate ripalescriptors. Determine scorelow.	Opti	imal  - 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  -5  -5  -6  -5  -5  -6  -6  -6  -6  -6	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % F	Tree stratum (dbh a with > 60% tree cc non-maintained una located within the located with	imal  3 inches) present, anopy cover and a derstory. Wellands e riparian areas.  5  each stream ban each by measuring Score for each r	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in 80%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % F	Tree stratum (dbh: with > 60% tree conon-maintained unclocated within the  1.  arian areas along in quare footage for e	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5		cores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % F	Tree stratum (dbh : with > 60% tree cc non-maintained une located within the located with	imal  3 inches) present, anopy cover and a derstory. Wetlands the riparian areas.  5  each stream ban each by measurin Score for each r 20% 1.1	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 80% 0.6	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	0.70	CI
Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % f	Tree stratum (dbh : with > 60% tree cc non-maintained une located within th  1. arian areas along a quare footage for e Riparian Area and % Riparian Area> Score >	imal  3 inches) present, anopy cover and a derstory. Wellands e riparian areas.  5  each stream ban each by measurin  Score for each r  20%  1.1	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 80% 0.6	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the control of the con	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies the seeded and stabilized area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >		CI 0.70
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Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB3	02080206	3/9/2016	06-STR-19		
	CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, inkments, spoil piles, constrictions, livestock  Conditional Category								
	Negligible	Mi	nor	Mode	erate	Sev	ere		
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

#### INSERT PHOTOS:



Typical view of stream

NC DWQ Stream Identification Form Version 4.11

06-STR-19

Date: 3/9/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.594075
Evaluator: L. Eggering & D. Mitchell	County: Henrico	Longitude: -77.483911
<b>Total Points:</b> 22.5 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemera Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 11.5)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1) _	1.5
11. Second or greater order channel	N	0 = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 6.5				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	o = 0	Yes:	= 3
C. Biology (Subtotal = $4.5$ )			$\sim$	
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	11	1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other methods.				
Notes: Small channel 5-6' bankfull width, depth 1-4"	. Field Sheet: 1	5-A-STRM-9.		
Sketch:		LOW /	tream 9	

		Stre		fied Stream M	lethodology f	or use in Virg	ginia	III I <i>)</i>			
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Area 06		VA	R2SB	02080206	3/9/2016		lengui	i actor		
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa		l —	1				
D. Mite	chell & L. Eg	gering			06-STR	-20 (Jo	rdan's E	<b>Branch</b>	)		
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream		ondition (erosion,						
	Optimal		Subo	ptimal		ginal	Po	or	Sev	ere	
	1	Who have				less than Severe or	Overwiden		1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or full) bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are stogetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to rewly develope	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, of floodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe ewer bank slopes. seent on 40-60% of tative protection on Streambanks may creat. AND/OR 40- h is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	sephy incused to excevate out, vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloundhing present.		
	sediment deposition 10% of	on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protecti 40% of the bar sediment depos	iks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	.4	:	2	1.	6	1		2.0
NOTES>>						15-A-Strm-					
	N BUFFERS: /		Con	an areas along the	e entire SAR. (roo	ugh measuremen			notes>>		
	Opti Tree stratum (dbh: with > 60% tree ca	imal  > 3 inches) present, addrestory. Wetlands	Con	an areas along the	e entire SAR. (roo		ts of length & wid				
2. RIPARIAN Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cu. non-maintained un	imal  > 3 inches) present, addrestory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
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Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 2. Determine scorelow.	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1.  arian areas along	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength area))	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-fill cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>		
Riparian Buffers  Condition Scores  1. Delineate ripa descriptors. 2. Determine scoelow. 3. Enter the % F	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 80%	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength area))	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-fill cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100		cores*0.01)/2	CI
Riparian Buffers  Condition Scores  Delineate ripadescriptors. Delineate ripadescriptors. Enter the % I	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each ri  20%  0.6	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 80% 1.1	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength area))	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-fill cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * Si		CI 0.93
Condition Scores  1. Delineate ript Jescriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree cz non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 20% 0.6  50% 1.1  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 80% 1.1  50% 0.6  Zes, water velocii	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below the present with the blocks below the present and congth and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dh) > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are prove.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with amaintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	1.00	
Condition Scores  1. Delineate ript descriptors. 22. Determine scoelow. 33. Enter the % f Right Bank Left Bank 33. INSTREAL	Tree stratum (dbh: with > 60% tree ca non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Score >  W HABITAT: V: root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 20% 0.6  50% 1.1  aried substrate si iffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 80% 1.1  50% 0.6  zes, water velocit exes, stable featu	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the control of the con	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & width of the control	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 1005  Low 1007  Low 1009  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.00	
Condition Scores  L. Delimeate rips descriptors. Left Bank  Left Bank  Instream Habitat/	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  M HABITAT: Vi root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream baneach by measurin 20% 0.6  50% 1.1  aried substrate si iffle poole completimal	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 80% 1.1  50% 0.6  zes, water velocit exes, stable featu  Subo  Stable habitat ele	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  W.  Il Category  Mary  Stable habitat ele	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  Blocks en  High  Deliant of the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.00	
Condition Scores  1. Delineate ripz descriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank 3. INSTREAI undercut banks; Instream	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  M HABITAT: Vi root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin 20% 0.6  50% 1.1 arried substrate si iffle poole completimal re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 80% 1.1  50% 0.6  zes, water velocitixes, stable features, stable features suboptimes with the present in 30-50% are adequate for are adequate for are adequate for are stable minimal.	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (on the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the canopy cover.  Stable habitat elepresent in 10-30% are adequate for a second control of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory. Low  0.75  sing the ovided for you  pris; stable substr	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.00	

Stream Impact Assessment Form Page 2									
Project#	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	csx	CSX			02080206	3/9/2016	06-STR-20		
	CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, mbankments, spoil piles, constrictions, livestock  Conditional Category								
	Negligible	Mi	nor	Mode	erate	Sev	ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		of the channel in the parameter PR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5	1	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

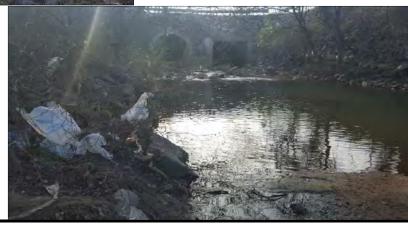
0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: View of Jordan's Branch Bottom Right: View of Jordan's Branch



NC DWQ Stream Identification Form Version 4.11 Jordan's Branch 06-STR-20

Date: 3/9/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.589817
Evaluator: L. Eggering & D. Mitchell	County: Henrico	Longitude: -77.480123
<b>Total Points:</b> 33.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 13	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0		2	3
ripple-pool sequence	0			3
Particle size of stream substrate	0	1	2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	<b>O</b>	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	N	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 9			<u> </u>	
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	= 3
C. Biology (Subtotal = 11.5)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other methods	. See p. 35 of manua			
Notes: Jordan's Branch - larger perennial stream. 3	35-40' bankfull w	idth, depth 3-6'.	Three large box cul	verts. Field
Sheet: 15-A-STRM-10.				
49FLOV	am 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	HHHHHH Railvard	N Û	

		Stre	Unit	fied Stream N	lethodology f	for use in Virg		m 1)				
Duning4#		Drainet Name			nels classified a	s intermittent or		CAD#	Impact/SAR	Impact		
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor		
N/A Nam	e(s) of Evaluation	2RVA - Area		VA e and Informa	R4SB ation	02080206	3/9/2016					
	chell & L. Eg		Otream Nam	c and imorni	ation	06-S	ΓR-21					
. Channel C	Condition: Asse	ess the cross-sec	ction of the stream	and prevailing c	ondition (erosion,							
	Opti	imal	Subo	ptimal c	Conditional Catego	ginal	Po	or	Sev	ere		
		Slightly incised, few areas of active Poor.		Often incised, but less than Severe or Overwidened/incised.				45				
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	n or natural rock, 00%). AND/OR bankfull benches ses to their original developed wide Mid-channel bars, ars few. Transient on covers less than	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). To depart of banks are stable (60-80%). To depart of banks are stable (60-80%) and for banks are stable (60-80%). To depart of banks are stable (60-80%). To depart of banks are stable (60-80%). To make the stablity. The bankfull and low flow to stability. The bankfull and low flow admined are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along protions of the reach. Transient		or Poor due to Ic Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se- temporary/tran instability. Depositi stability, may be AND/OR V-shap	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be isient, contribute on that contribute to forming/present. ed channels have	widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in		Lebery incused (or extraetor), vertical/lateral instability. Severe on incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% banks, is not preventing erosion.  Obvious bank sloughing present. Erosion/raw banks on 80-100%.		rere the rage nks ree 20% of on. ent. 1%6.	
	1070 011	bottom.	stream					40% of the banks and stable sediment deposition is absent.		uting to instability. channels and/or ean flow.	CI	
Score	3	3	2	.4		2	1.	6	1		1.6	
NOTES>>				Fie	eld Sheet: 1	5-A-STRM-	11.					
DIDADIA	I DUESEDO .											
Z. KIPAKIAI	N BUFFERS: A	Assess both bank				ugh measuremen	ts of length & widt	h may be accep	NOTES>>			
	Opti	imal		Conditional Category Suboptimal Marginal			Poor		NOTEOFF			
Riparian Buffers		anopy cover and a derstory. Wetlands	containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.				
Condition		_	High	Low	High	Low	High	Low				
Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5				
lescriptors. 2. Determine so pelow.	arian areas along o juare footage for e Riparian Area and	each by measurin	g or estimating le	ngth and width. (	Calculators are pr		Ensure the of % R	iparian				
Right Bank	% Riparian Area> Score >	30% 1.1	70% 0.5					100%				
	ov Diagram	400/	000/					1000/	CI= (Sum % RA * S			
Left Bank	% Riparian Area>	10% 1.1	90% 0.6					100%	Rt Bank CI >	0.68 0.65	0.67	
	M HABITAT: Va	aried substrate si	zes, water velocit		ody and leafy deb	bris; stable substr	ate; low embeded	ness; shade;	NOTES>>			
indercut banks;	root mats; SAV; ri											
Instream Habitat/	Opti	imal		ptimal	Mar	ginal	Po					
Available			present in 30-50%	6 of the reach and	present in 10-309			stable. Habitat				
	Habitat elements are typically present present in 30-50% of the reach and				present in 10-30% of the reach and are adequate for maintenance of populations. lacking or are unstable. Habitat elements are typically present in letter than 10% of the reach.							
Score	In greater than 50		popul	ations.	popul					CI 0.90		

	St	ream In	npact A	ssessm	ent For	rm Page	e 2				
Project #	Applicant	Locality	lity Cowardin Class. HUC Date Data Point				SAR length	Impact Factor			
N/A	csx		VA	R4SB	02080206	3/9/2016	06-STR-21				
	ALTERATION: Stream cross poil piles, constrictions, livestock	sings, riprap, conc	rete, gabions, or		straightening of cl	hannel, channeliz	zation,	NOTES>> Likely alter	red long		
	Negligible	Minor		Moderate		Sev	/ere	ago by the railroad.			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	30% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or nent.				
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5				
	REACH C	ONDITION II	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH				

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: View downstream to confluence with Jordan's Branch Top Right: View west with pipe draining to stream from Acca Yard

Bottom Left: View of culverts at upstream terminus

Bottom Right: Typical view upstream

NC DWO Stream Identification Form Version 4.11

06-STR-21

Date: 3/9/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.589550
Evaluator: L. Eggering & D. Mitchell	County: Henrico	Longitude: -77.480061
<b>Total Points:</b> 29.5 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemera Intermitten Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*			3	
·				
A. Geomorphology (Subtotal = 15)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	(2)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $8.5$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	<u> </u>	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17 Soil-based evidence of high water table?	No.	0 = 0	Yes	= 3

12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	9	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	lo = 0	Yes:	= 3
C. Biology (Subtotal = 6				

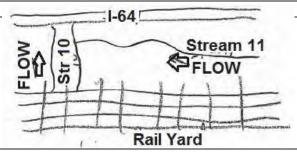
C. Biology (Subtotal = <u>6</u> )				
18. Fibrous roots in streambed	3	2	Θ	0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	0	1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other = 0	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Flows into Stream 10 from the south between I-64 and rail yard. Bedrock present and big chunks of concrete.

Field Sheet: 15-A-STRM-11.

Sketch:



		Stre					(For	m 1)					
						for use in Virg							
Project #		Project Name Locality			Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor			
N/A	DC	2RVA - Area	06	VA	R2SB3	02080206	3/17/2016						
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa									
J. Bu	ıdnik & K. As	stroth			06-S	TR-22 (	Proctor C	reek)					
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream	n and prevailing c	ondition (erosion,	aggradation)							
	Opt	imal	Subo	ptimal	onditional Catego	ginal	Po	or	Sev	ere			
	1	Slightly incised, few areas of active					Overwiden	ed/incised.	1	5			
Channel Condition	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transprose hors faw. Transpart		cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along	ity or Poor due to lower bank slopes. Erosion may be present on 40-60% of k both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40- 60% of stream is covered by sediment. Sediment may be temporary/transient, contribute		Vertically/laterally unstable. Likely to widen further. Majority of both banks f are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in		incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sl Erosion/raw ban	stability. Severe tained within the d below average ajority of banks ut. Vegetative in less than 20% of venting erosion. bughing present. ks on 80-100%.				
		on covers less than	portions of the reach. Transient sediment covers 10-40% of the stream bottom.		nsient stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the				AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	С		
Score	;	3	2	.4	:	2	1.	6	1		2.0		
NOTES>> 2. RIPARIAI	N BUFFERS: /	Assess both bank	s's 100 foot riparia			14-B-STR-		th may be accep	otable)				
	04	:a1		ditional Cate		ulu al	D-		NOTES>>				
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a		Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.		High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine	Highway 26 of stream a right bank. in riparian the left ban	long the WTL-17 is area along	
• ""		High Low High Low High Low											
Condition Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5					
descriptors. 2. Determine so pelow.	arian areas along quare footage for e Riparian Area and % Riparian Area>	each by measurin	g or estimating le	ngth and width. (	Calculators are pr		Ensure the of % R	iparian					
Right Bank	Score >	1.2	40% 0.5					100 /0					
Left Bank	% Riparian Area>	55% 1.5	30% 1.2	15% 0.75				100%	Cl= (Sum % RA * Si Rt Bank Cl >	0.92 1.30	CI		
3. INSTREAL	M HABITAT: V	aried substrate si	zes, water velocit	ty and depths; wo	ody and leafy deb	bris; stable substr	ate; low embeded	lness; shade;	NOTES>>				
	root mats; SAV; r	iffle poole comple	exes, stable featu	res. Conditiona	I Category								
Instream	Conditional Suboptimal		Stable habitat elements are typically elements are typically Stable habitat elements are typically present in 10-30% of the reach and elements are typically present in 10-30% of the reach an				lacking or are unstable. Habitat						
Habitat/ Available			present in 30-50% are adequate fo	% of the reach and r maintenance of	present in 10-30% are adequate fo	% of the reach and or maintenance of	lacking or are ur elements are typica	nstable. Habitat ally present in less					
Habitat/	Habitat elements a in greater than 5		present in 30-50% are adequate fo popul	% of the reach and	present in 10-30% are adequate fo popul	% of the reach and	lacking or are ur	nstable. Habitat ally present in less f the reach.			C 1.2		

	Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2SB3	02080206	3/17/2016	06-STR-22			
I. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, imbankments, spoil piles, constrictions, livestock  Conditional Category										
	Negligible	nor	Mod	erate	Sev	rere				
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed	y of the channel in the parameter OR 80% of banks bion, riprap, or			
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: View upstream toward CUL-35 under railroad Top Right: View downstream from CUL-35

**Bottom Left: Typical view downstream** 

Bottom Right: Typical view of stream in wooded portion

NC DWQ Stream Identification Form Version 4.11

Proctors Creek 06-STR-22

Project/Site: DC2PVA - Area 06 | Latitude: 37 390434

Date: 3/17/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.390434
Evaluator: J. Budnik, K. Astroth	County: Chesterfield	Longitude: -77.452167
<b>Total Points:</b> 42.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitter Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 19	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes:	= 3
a artificial ditches are not rated; see discussions in manual	•			
B. Hydrology (Subtotal = $10$ )			_	
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = <u>13.75</u> )				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	1	(2)	3
22. Fish	0	0.5		1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other method	ods. See p. 35 of manua			
Notes: Proctors Creek. Stream runs under railroa	ad via Culvert 33. V	VTL-12 is the floo	odplain for this stre	am. Field
Sheet: 17-BISTR-18.	+ 33		_	_
	100			
Sketch:	San Mark	1		
القالقا	FLOW	-		
concrete ballast	-	The state of the s		
HOI I E	5			
H	0708	-		
H	70	1		
	cul	rip-rap	_	

		Stre	Unit	SSESS fied Stream N	lethodology f	for use in Virg	ginia	m 1)			
Project #		Project Name		wadeable chan  Locality	nels classified a Cowardin Class.	HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Area		06	VA	R4SB4	02080206	3/17/2016		lengui	1 actor	
Nam	e(s) of Evaluator(s)		Stream Nam	e and Informa	ation						
J. Bı	ıdnik & K. As	stroth				06-S	ΓR-23				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Optimal		Subo	ptimal	onditional Catego	ginal	Po	or	Sev	ere	
	Very little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient		1			less than Severe or	Overwiden		1	5	
Channel Condition			erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow Il defined. Stream o bankfull benches, d floodplains along	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe ower bank slopes. resent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be isient, contribute to torming/present.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu- erosion. AND/OI stream is cover Sediment is temp nature, and contril	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. orary/transient in buting to instability.	Deeply incised vertical/lateral ininicision, flow con banks. Streambe rooting depth, m vertical/lunderc protection present o banks, is not pre Obvious bank slt Erosion/raw ban AND/OR Aggradin	stability. Severe tained within the dd below average ajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%.	
		sediment deposition covers less than 10% of bottom. sediment tovers 10-40% of the stream bottom. stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.		AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.		than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	С			
Score	3	3	2	.4		2	1.	6	1		2.0
DIDADIA	L DUEEEDO:										
2. RIPARIAI	N BUFFERS: /	Assess both bank	Con	an areas along the ditional Cate ptimal	gory	ugh measuremen	ts of length & wid		notes>>		
2. RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con	ditional Cate	gory	Ginal  Low Marginal:  Non-maintained, dense herbaceous vegetation,					
Riparian Buffers	Opti Tree stratum (dbh ; with > 60% tree cr. non-maintained un	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ir iparian areas lacking shrub and tree stratum, hor production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious spoil lands, denuded surfaces, row crops, active feed oots, ratik, or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 90%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %	Tree stratum (dbh: with > 60% tree cr non-maintained un located within th  1. arian areas along quare footage for e	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both abrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100		cores*0.01)/2	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 10% 1.1	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 90%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >	0.56	CI
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree cc non-maintained un- located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  M Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 10% 1.1  100% 1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 90% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI > NOTES>>		CI 0.8
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the %  Right Bank  Left Bank  3. INSTREAl undercut banks;	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 10% 1.1  100% 1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 90% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provinced to the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	0.56	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 10% 1.1  100% 1.2  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 90% 0.5	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Acalculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, inparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI > NOTES>>	0.56	
Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree co. non-maintained un located within th located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  M Riparian Area> Score >  M HABITAT: Vi. root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  10%  1.1  100%  1.2  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 90% 0.5	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the rovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t     of % R     Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed older conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI > NOTES>>	0.56	0.8
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi; root mats; SAV; r  Opti Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  10%  1.1  100%  1.2  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Kinto Condition C g or estimating le parian category in 90% 0.5	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the rovided for you  bris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % Reserved Blocks estable Blocks	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  he sums iparian qual 100  100%  100%  Iness; shade;	NOTES>>  CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI > NOTES>>	0.56	

#### **Stream Impact Assessment Form Page 2** Locality Cowardin Class HUC Data Point Project # Applicant Date SAR length Impact Factor N/A CSX R4SB4 02080206 3/17/2016 06-STR-23 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> Conditional Category Negligible Minor Moderate Severe 40 - 60% of reach is disrupted by any of the channel 60 - 80% of reach s disrupted by any of the channel 20-40% of the Less than 20% of terations listed i Iterations listed i Greater than 80% of reach is the stream reach is disrupted by any of the channel Channel stream reach is lisrupted by any o the parameter guidelines. If the parameter guidelines. If disrupted by any of the channel alterations listed in the parameter Channelization, dredging, alteration, or hardening absent. Stream has an Alteration the channel guidelines AND/OR 80% of banks stream has been stream has beer Iterations listed in the parameter guidelines. unaltered pattern or has naturalized. terations listed in channelized, normal stable stream meander channelized, normal stable shored with gabion, riprap, or cement. the parameter guidelines. stream meande pattern has not pattern has not recovered. CI SCORE 1.5 1.3 1.1 0.5 1.30 0.9 0.7

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### **INSERT PHOTOS:**



Top Left: Vie of stream as it enters wetland Top Right: Typical view upstream Bottom Left: Typical view of stream in wooded area Bottom Right: Typical view of stream

NC DWQ Stream Identification Form Version 4.11

06-STR-23

Date: 3/17/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.387893
Evaluator: J. Budnik, K. Astroth	County: Chesterfield	Longitude: -77.454372
<b>Total Points:</b> 19.25 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 7)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	$\odot$	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits		1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 4.5				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes	= 3
C. Biology (Subtotal = 7.75			•	
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	8	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1)	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other method	ds. See p. 35 of manua			
Notes: Stream 3 is intermittent above WTL-02. Fig.	eld Sheet: 18-B-S	TR-03 Data pt 2.		
Sketch: WTL-02	ballast / acc	ess road	1	H1
	<	FLOW		

		Stre	Uni	fied Stream N	lethodology f	or use in Virg		m 1)			
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Area 0		06	VA	R4SB	02080206	3/17/2016		leligili	ractor	
Nam	e(s) of Evalua	itor(s)	Stream Nam	e and Informa	ation						
J. Bı	ıdnik & K. As	nik & K. Astroth				06-S	ΓR-24				
1. Channel C	Condition: Assess the cross-section of the stre										
	Optimal		Subo	ptimal	onditional Catego Mar	ry ginal	Po	or	Sev	ere	
	Very little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient		1			less than Severe or	Overwiden		1	5	
Channel Condition			erosion or unprote of banks are s Vegetative protec prominent (60 Depositional feal stability. The ban channels are we likely has access t or newly develope	tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow Il defined. Stream to bankfull benches, d floodplains along	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/Of stream is covere Sediment is temp nature, and contrik	ority of both banks Frosion present on ks. Vegetative nt on 20-40% of ifficient to prevent R 60-80% of the ed by sediment. orary/transient in buting to instability.	Deeply incised vertical/lateral inisincision, flow con banks. Streambe rooting depth, m vertical/lundercrotection present o banks, is not pre Obvious bank slc Erosion/raw ban AND/OR Aggrading	stability. Severe tained within the d below average ajority of banks ut. Vegetative in less than 20% of venting erosion. bughing present. ks on 80-100%.	
	10% of	and transverse dats lew. Iransvert seatment deposition covers less than 10% of bottom. portions of the reach. Transient sediment covers 10-40% of the stream bottom. stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.		AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable		than 80% of stream deposition, contrib Multiple thread of subterrand	bed is covered by uting to instability. channels and/or	C			
Score	1	3		.4		2	1.		1 d headcuts.	1	
NOTES>> 2. RIPARIAI	N BUFFERS: /	·		Fi	eld Sheet:	18-B-STR-(	)4.				
				ditional Cate					NOTES>>		
Riparian Buffers	Tree stratum (dbh: with > 60% tree ca non-maintained un	Optimal  Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.		Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
			High	Low	High	Low	High	Low			
Condition Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
descriptors. 2. Determine so pelow.	arian areas along quare footage for e	each by measurin	g or estimating le	ngth and width. (	Calculators are pr		Ensure to	liparian qual 100			
	% Riparian Area>	100% 1.2						100%			
Right Bank	1								CI= (Sum % RA * So	cores*0.01)/2	
Right Bank				400/.				100%	Rt Bank CI >	1.20	CI
Right Bank  Left Bank	% Riparian Area>	50%	10%	% Riparian Area>         50%         10%         40%           Score>         0.75         1.1         0.5           M HABITAT: Varied substrate sizes, water velocity and depths; w			the state of the s		LA Borde OL	0.60	
Left Bank	Score >	0.75 aried substrate si	1.1 zes, water veloci	0.5 by and depths; wo		oris; stable substr	ate; low embeded	Iness; shade;	Lt Bank CI >	0.69	0.9
Left Bank	Score > M HABITAT: Va	0.75 aried substrate si	1.1 zes, water veloci exes, stable featu	0.5 ty and depths; wo res. Conditiona	l Category					0.69	0.9
Left Bank 3. INSTREAI undercut banks; Instream Habitat/ Available	Score > M HABITAT: Va ; root mats; SAV; r	0.75 aried substrate si riffle poole comple rimal are typically present	2.1 zes, water veloci exes, stable featu Subo Stable habitat ele present in 30-50%	0.5 by and depths; wo	Mar Stable habitat ele present in 10-309	ginal ments are typically 6 of the reach and r maintenance of	Po Habitat elements lacking or are ur elements are typic	listed above are nstable. Habitat ally present in less		0.69	
Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Score > M HABITAT: Vi root mats; SAV; r  Opti  Habitat elements a in greater than 5	0.75 aried substrate si riffle poole comple rimal are typically present	2es, water velociexes, stable features Subor Stable habitat elepresent in 30-50% are adequate for popul	ty and depths; wo res.  Conditiona ptimal ments are typically 6 of the reach and	Stable habitat ele present in 10-30° are adequate fo	ginal ments are typically % of the reach and	Po Habitat elements lacking or are ur	i listed above are stable. Habitat ally present in less f the reach.		0.69	0.9 C

Channel Alteration SCORE	Channelization, dredging, alteration, or hardening absent. Stream has an inaltered pattern or has naturalized.  1.5  REACH CC should be rounded to 2 decimal places. The stream of the s	Min Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.  1.3  NNDITION IN	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.  1.1  NDEX and S	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  0.9  TREAM CON	HUC  02080206  straightening of cl  60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  0.7	Greater than 8 disrupted by an alterations listed guidelines AND/C shored with ga cerr	0% of reach is yof the channel in the parameter R8 80% of banks bion, riprap, or ent.  5 IS REACH THE REACH C	NOTES>>  CONDITION INI I= (Sum of all C ON REQUIREM I X LF X IF	l's)/5	CI 1.30
4. CHANNEL A embankments, spo  Channel Alteration  SCORE	ALTERATION: Stream crossin ill piles, constrictions, livestock  Negligible  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  1.5  REACH CC should be rounded to 2 decimal places. The stream of the stream of	Min Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.  1.3  NNDITION IN	Conditiona nor  20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.  1.1	I Category  Mod  40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  0.9  TREAM CO	erate  60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/C shored with ga cerr	on the compensation of the	CONDITION INI I= (Sum of all C	l's)/5	1.30
Channel Alteration Country Cou	Negligible  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  1.5  REACH CC should be rounded to 2 decimal places. To	Min Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.  1.3  NNDITION IN	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.  1.1  NDEX and S	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  0.9  TREAM CON	erate  60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/C shored with ga cerr	0% of reach is yof the channel in the parameter R8 80% of banks bion, riprap, or ent.  5 IS REACH THE REACH C	CONDITION INI I= (Sum of all C	l's)/5	1.30
Channel Alteration Country SCORE	Negligible  Channelization, dredging, alteration, or hardening absent. Stream has an inaltered pattern or has naturalized.  1.5  REACH CC should be rounded to 2 decimal places. The stream of the str	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.  1.3  DNDITION IN	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.  1.1  NDEX and S	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/C shored with ga cerr	0% of reach is y of the channel in the parameter R 80% of banks bion, riprap, or ent.  5 IS REACH THE REACH C	I= (Sum of all C	l's)/5	1.30
SCORE  NOTE: The Cls and RCI	Channelization, dredging, alteration, or hardening absent. Stream has an inaltered pattern or has naturalized.  1.5  REACH CC should be rounded to 2 decimal places. The stream of the s	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.  1.3  DNDITION IN	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.  1.1  NDEX and S	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  0.9  TREAM CON	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/C shored with ga cerr	0% of reach is y of the channel in the parameter R 80% of banks bion, riprap, or ent.  5 IS REACH THE REACH C	I= (Sum of all C	l's)/5	1.30
SCORE  NOTE: The Cls and RCI	Channelization, dredging, alteration, or hardening absent. Stream has an inaltered pattern or has naturalized.  1.5  REACH CC should be rounded to 2 decimal places. The stream of the s	the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.  1.3  ONDITION IN	stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.  1.1  NDEX and S	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/C shored with ga shored with ga cerr	y of the channel in the parameter IR 80% of banks bion, riprap, or ent.  5 IS REACH THE REACH RC COMPENSATI	I= (Sum of all C	l's)/5	1.30
NOTE: The CIs and RCI:	REACH CC should be rounded to 2 decimal places. The	ONDITION IN	NDEX and S	TREAM CO		ITS FOR TH	IS REACH THE REACH ( RC COMPENSATI	I= (Sum of all C	l's)/5	1.30
	should be rounded to 2 decimal places. Th				NDITION UN		THE REACH ( RC COMPENSATI	I= (Sum of all C	l's)/5	0
	should be rounded to 2 decimal places. Th						THE REACH ( RC COMPENSATI	I= (Sum of all C	l's)/5	0
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DESCRIBE PR	OPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11

06-STR-24

Date: 3/17/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.383743
Evaluator: J. Budnik, K. Astroth	County: Chesterfield	Longitude: -77.454515
<b>Total Points:</b> 25.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

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0			1.5
0			1.5
		OBL = 1.5 Other = 0	
p. 35 of manua			
•		R-04	
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		Stre	Uni	SSESS fied Stream N	lethodology f	or use in Virg	ginia	m 1)			
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Area		06	VA	R4SB	02080206	3/17/2016		lengui	1 actor	
Nam	e(s) of Evaluator(s)		Stream Nam	e and Informa	ation						
J. Bu	ıdnik & K. As	stroth				06-S	ΓR-25				
1. Channel C	Condition: Assess the cross-section of the stre		tion of the stream								
	Optimal		Subo	ptimal	onditional Catego	<sub>ry</sub> ginal	Po	or	Sev	ere	
	Very little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient		1			less than Severe or	Overwiden		1	5	
Channel Condition			erosion or unproted of banks are stogetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to revelope the protection of the	tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow Il defined. Stream o bankfull benches, d floodplains along	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe were bank slopes. seent on 40-60% of tative protection on Streambanks may creut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu- erosion. AND/OI stream is cover Sediment is temp nature, and contril	ority of both banks frosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. iorary/transient in puting to instability.	incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sic Erosion/raw ban	stability. Severe tained within the do below average hajority of banks ut. Vegetative on less than 20% of eventing erosion. Doughing present. ks on 80-100%.	
		sediment deposition covers less than 10% of bottom. portions of the reach. Transie sediment covers 10-40% of the stream bottom.		rs 10-40% of the	stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.  AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.		AND/OR Aggrading channel. Greater		С		
Score	3	3	2	.4		2	1.	6	1	1	2.0
2. RIPARIAI	N BUFFERS: /		Con	ditional Cate	gory				notes>>		
2. RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree		gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a href="https://district.org/linearing/">https://district.org/</a>	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-wighted area, recently seeded and stabilized, or other comparable condition.				
Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cr. non-maintained un	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed jobs, active feed of other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating leparian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 40%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
Riparian Buffers  Condition Scores  Delineate rip descriptors. Delescriptors. Enter the % l	Tree stratum (dbh: with > 60% tree conon-maintained un located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating leparian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5		cores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate rip descriptors. Delescriptors. Enter the % l	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 40% 0.75	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 40% 1.2	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. ( n the blocks below 20%  0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	0.88	CI
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  M Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 40% 0.75  40% 0.75  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 40% 1.2  40% 1.2  zes, water velocii	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 20% 0.5  ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * Si		CI 0.8
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the %  Right Bank  Left Bank  3. INSTREAl undercut banks;	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 40% 0.75  40% 0.75  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 40% 1.2  40% 1.2  zes, water velocii	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 20% 0.5  ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provinced to the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.88	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 40% 0.75  40% 0.75  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 40% 1.2  40% 1.2  zes, water velocit exes, stable featu	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. ( In the blocks below 20% 0.5  20% 0.5  ty and depths; wo res.  Conditiona ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicate the control of the cont	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hap production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.88	
Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree conon-maintained un located within th  1.  arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> root mats; SAV; r  Opti Habitat elements a	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  40%  0.75  40%  0.75  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 40% 1.2  2es, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 20% 0.5  Low 20% 0.5  Conditional ments are typically who file reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically % of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % Reserved Blocks estable Blocks	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.88	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi. root mats; SAV; r  Opti Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  40%  0.75  40%  0.75  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 40% 1.2  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 20% 0.5  ty and depths; wo res.  Conditional ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % Reserved Blocks estable Blocks	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  he sums iparian qual 100  100%  100%  Iness; shade;	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.88	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Date Data Point SAR length Impact Factor Project # N/A CSX R4SB 02080206 3/17/2016 06-STR-25 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach is disrupted by any of the channel alterations listed in stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. CI SCORE 1.5 0.5 1.3 1.1 0.9 0.7 1.10

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Culvery 54
Middle Top: Typical view of stream
Top Right: Typical view of stream

Bottom Left: Culvert 53 Middle Bottom: Culvert 52

**Bottom Right: Typical view of stream** 

NC DWQ Stream Identification Form Version 4.11

06-STR-25

Date: 3/17/2016	Project/Site: DC	2RVA - Area 06	Latitude: 37.383614		
Evaluator: J. Budnik, K. Astroth	County: Chester	rfield	Longitude: -77.454603		
<b>Total Points:</b> 24.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal = 11.5	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3	
2. Sinuosity of channel along thalweg	0	1	(2)	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	(1)	2	3	
7. Recent alluvial deposits	0	(1)	2	3	
8. Headcuts	0	1	(2)	3	
9. Grade control	0	0.5	1	1.5	
40 M / 1 W	0	0.5	1	1.5	
10. Natural valley					

B. I	Hvdrology	(Subtotal = 5
------	-----------	---------------

12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles		0.5	1	1.5
17. Soil-based evidence of high water table?	(N	lo = 0	Yes	= 3

C. Biology (Subtotal = 8.25)

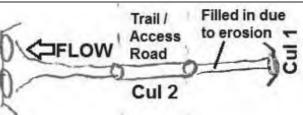
o. 2.0.09) (Gastota:				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.73; (	OBL = 1.5 Other = 0	)

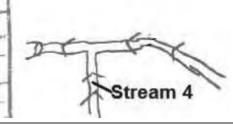
\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream flows under railroad via 18-B-Cul-1, and then under trail/access road via 18-B-Cul-2. Stream flows

underground on the side of the tracks in some areas. Field Sheet: 18-B-STR-01.

Sketch: Gas Station **Pumps** 





		Stre	Unit	fied Stream M	lethodology f	or use in Virg		m 1)		
Project #		Project Name		wadeable chan	Cowardin	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact
		-		,	Class.			JAN#	length	Factor
N/A Nam	ne(s) of Evalua	tor(s)		VA e and Informa	R2	02080205	N/A			
INGIII	ie(s) oi Evalua	101(3)	Stream Nam	e and imornia		TR-Δ-0 <sup>2</sup>	1 (James	River)		
Channel (	Condition: Asse	ess the cross-sec	tion of the stream	n and prevailing c			i (Gaines	itivery		
	Opti				onditional Catego		Po	or	Sev	vor o
	- Opti	e de la constantination de la constantinatio	Supo 400	ptimai	- Viai	ymai	1	OI PLA	A Sev	
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse bar	n or natural rock, 00%). AND/OR bankfull benches ass to their original y developed wide Mid-channel bars, ars few. Transient on covers less than	erosion or unproted of banks are sit Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope portions of the risk presentations.	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to kfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient s 10-40% of the bottom.	Poor. Banks more or Poor due to lc Erosion may be pri both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran insatability. Deposition stability, may be AND/OR V-shap vegetative protects banks and deposition or Poor Poor Book 100 protection and provided the protection of the poor Book 100 protection protection protection and protection protectin protection protection protection protection protection protecti	less than Severe or stable than Severe wer bank slopes. seent on 40-60% of tative protection on Streambanks may rerut. AND/OR 40-n is covered by diment may be sient, contribute to forming/present. ed channels have on on > 40% of the onal features which	widen further. Maj are near vertical. 60-80% of ban protection prese banks, and is insu erosion. AND/OI stream is coverr Sediment is temp nature, and contril AND/OR V-shape vegetative protect 40% of the bar	unstable. Likely to ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the dby sediment. orary/transient in justing to instability. dc channels have on is present on > iks and stable	Deeply incised vertical/lateral in incision, flow cor banks. Streambe rooting depth, ru vertical/underc protection present of banks, is not pre Obvious bank sli Erosion/raw bar AND/OR Aggradin than 80% of strean deposition, contrib	stability. Severe tained within the de below average lajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%. g channel. Greater b bed is covered by
					contribute	to stability.			Multiple thread subterran	
Score		3	_	.4	-	2	1.		1	
NOTES>>	This fiel	ld sheet is	missing. In	nformation			nation from	two other	data point	s on the
						River				
. RIPARIA	N BUFFERS: A		Con	ditional Cate	e entire SAR. (roo	ugh measuremen	its of length & wid		NOTES>>	ueina
RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	*	e entire SAR. (roo		High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable		NOTES>> Filled out u aerials	ısing
Riparian Buffers	Tree stratum (dbh : with > 60% tree cc. non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Filled out u aerials	ısing
Riparian Buffers	Option  Tree stratum (dbh with > 60% tree canon-maintained und	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious Impervious spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.	NOTES>> Filled out u aerials	ısing
Riparian Buffers  Condition Scores  Delineate rip secriptors. Determine so	Tree stratum (dbh : with > 60% tree cc. non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Filled out u aerials	ısing
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Riparian Buffers  Condition Scores  Delineate rip secriptors. Determine so	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Filled out u aerials	
Riparian Buffers  Condition Scores  Delineate rip secriptors. Determine selow. Enter the %  Right Bank	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strain areas along of quare footage for e	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  .5  each stream ban each by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 25%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Filled out u aerials	
Riparian Buffers  Condition Scores  Delineate rip secriptors. Determine so blow. Enter the %  Right Bank	Tree stratum (dbh : with > 60% tree cc non-maintained un located within th  1. parian areas along a quare footage for e Riparian Area and % Riparian Area> Score >	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each ri  50%  1.1	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le caparian category in 25% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. ( n the blocks below 25% 0.75	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prov.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Filled out u aerials	cores*0.01)/2
Riparian Buffers  Condition Scores  Delineate rip secriptors. Determine st slow. Enter the %  Right Bank  Left Bank  INSTREA	Tree stratum (dbh : with > 60% tree conon-maintained und located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  50%  1.1  50%  1.1  arried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.5  25% 0.5  Zes, water velocit	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Co ngth and width. ( n the blocks belov 25% 0.75  ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are proved.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Filled out u aerials  Cl= (Sum % RA * S Rt Bank Cl >	cores*0.01)/2 <b>0.86</b>
Condition Scores  Delineate ripscriptors. Determine solow. Enter the % Right Bank  Left Bank	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  50%  1.1  50%  1.1  arried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.5  25% 0.5  Zes, water velocit exes, stable featur	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (coungth and width. (coungth and width. (coungth and width. (coungth and depths; wores.  Conditiona ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Indition Scores us Calculators are provided to the condition of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Filled out u aerials  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2 <b>0.86</b>
Condition Scores  Delineate rip secriptors. Determine so alow. Enter the %  Right Bank  Left Bank  INSTREAI ndercut banks  Instream	Tree stratum (dbh : with > 60% tree conon-maintained und located within the located withi	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  50% 1.1  50% 1.1  arried substrate si iffle poole completimal	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% present, with 30% present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.5  25% 0.5  zes, water velocit exes, stable featur  Subo  Stable habitat ele present in 30-50% are adequate fo	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 25% 0.75  25% 0.75  ty and depths; wores.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  I Category  War  Stable habitat ele present in 10-30% are adequate for a second control or cont	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory. Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil fands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Filled out u aerials  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl > NOTES>>	cores*0.01)/2 <b>0.86</b>

	St	ream In	npact A	ssessm	ent For	m Pag	e 2			
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX		VA	R2	02080205	N/A	06STR-A01			
4. CHANNE	L ALTERATION: Stream cross	ings, riprap, conc	rete, gabions, or	concrete blocks,	straightening of ch	hannel, channel	ization,	NOTES>>	<u>'</u>	
embankments, s	spoil piles, constrictions, livestock		Conditiona	I Category						
	Negligible	Mi	nor	Mod	erate	Se	evere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than disrupted by a alterations liste guidelines AND shored with g	80% of reach is ny of the channel d in the parameter (OR 80% of banks pabion, riprap, or ment.			CI
SCORE	1.5	1.3	1.1	0.9	0.7		0.5			0.90
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR T				
NOTE: The CIs and F	RCI should be rounded to 2 decimal places. T	he CR should be roun	nded to a whole numb	er.			THE REACH (	CONDITION IN I= (Sum of all C		
							COMPENSATI			0
INSERT PHO								IX LF X IF		
DESCRIBE F	PROPOSED IMPACT:									

NC DWQ Stream Identification Form Version 4.11 James River 06-STR-A-01

Total Points: 0 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*  A. Geomorphology (Subtotal =)  A. Geomorphology (Subtotal =)  Abs  1ª. Continuity of channel bed and bank  2. Sinuosity of channel along thalweg  3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence  4. Particle size of stream substrate  5. Active/relict floodplain  6. Depositional bars or benches  7. Recent alluvial deposits  8. Headcuts  9. Grade control  10. Natural valley  11. Second or greater order channel  a artificial ditches are not rated; see discussions in manual  B. Hydrology (Subtotal =)  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?	No = 0	Coircle one	titude: 37.536378 ngitude: -77.4935 her . Quad Name:  derate 2 2 2 2 1 1 Yes = 3	
Total Points: 0   Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* Epheme   A. Geomorphology (Subtotal =) Abs   1a. Continuity of channel bed and bank 0   2. Sinuosity of channel along thalweg 0   3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence 0   4. Particle size of stream substrate 0   5. Active/relict floodplain 0   6. Depositional bars or benches 0   7. Recent alluvial deposits 0   8. Headcuts 0   9. Grade control 0   10. Natural valley 0   11. Second or greater order channel artificial ditches are not rated; see discussions in manual   B. Hydrology (Subtotal =)   12. Presence of Baseflow 0   13. Iron oxidizing bacteria 0   14. Leaf litter 1   15. Sediment on plants or debris 0	Determination (eral Intermitter)  Sent W  O  No = 0	(circle one) Ott e.g  /eak Mo 1 1 1 1 1 1 1 1 1 1 1 1 0.5 0.5	her  . Quad Name:    Quad Name:	Strong  3 3 3 3 3 3 1.5 1.5 3 3
Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*  A. Geomorphology (Subtotal =)  Abs  1ª Continuity of channel bed and bank  2. Sinuosity of channel along thalweg  3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence  4. Particle size of stream substrate  5. Active/relict floodplain  6. Depositional bars or benches  7. Recent alluvial deposits  8. Headcuts  9. Grade control  10. Natural valley  11. Second or greater order channel  3ª artificial ditches are not rated; see discussions in manual  B. Hydrology (Subtotal =)  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?	eral Intermitter  ent W  No = 0	Perennial   e.g	Quad Name:	3 3 3 3 3 3 3 1.5 1.5
1ª. Continuity of channel bed and bank  2. Sinuosity of channel along thalweg  3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence  4. Particle size of stream substrate  5. Active/relict floodplain  6. Depositional bars or benches  7. Recent alluvial deposits  8. Headcuts  9. Grade control  10. Natural valley  11. Second or greater order channel  a artificial ditches are not rated; see discussions in manual  B. Hydrology (Subtotal =)  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?	No = 0	1 1 1 1 1 1 1 0.5 0.5	2 2 2 2 2 2 2 1 1 1 Yes = 3	3 3 3 3 3 3 3 1.5 1.5
1ª- Continuity of channel bed and bank  2. Sinuosity of channel along thalweg  3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence  4. Particle size of stream substrate  5. Active/relict floodplain  6. Depositional bars or benches  7. Recent alluvial deposits  8. Headcuts  9. Grade control  10. Natural valley  11. Second or greater order channel  a artificial ditches are not rated; see discussions in manual  B. Hydrology (Subtotal =)  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?	No = 0	1 1 1 1 1 1 0.5 0.5	2 2 2 2 2 2 1 1 1 Yes = 3	3 3 3 3 3 3 1.5 1.5
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence 4. Particle size of stream substrate 5. Active/relict floodplain 6. Depositional bars or benches 7. Recent alluvial deposits 9. Grade control 10. Natural valley 11. Second or greater order channel 12 artificial ditches are not rated; see discussions in manual 13. Hydrology (Subtotal =) 12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 15. Sediment on plants or debris 16. Organic debris lines or piles 17. Soil-based evidence of high water table?	No = 0	1 1 1 1 1 1 0.5 0.5	2 2 2 2 2 1 1 1 Yes = 3	3 3 3 3 3 1.5 1.5
ripple-pool sequence  4. Particle size of stream substrate  5. Active/relict floodplain  6. Depositional bars or benches  7. Recent alluvial deposits  8. Headcuts  9. Grade control  10. Natural valley  11. Second or greater order channel  1 artificial ditches are not rated; see discussions in manual  13. Hydrology (Subtotal =)  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?	No = 0	1 1 1 1 0.5 0.5 1 1 1 0.5	2 2 2 2 1 1 1 Yes = 3	3 3 3 3 1.5 1.5
4. Particle size of stream substrate       0         5. Active/relict floodplain       0         6. Depositional bars or benches       0         7. Recent alluvial deposits       0         8. Headcuts       0         9. Grade control       0         10. Natural valley       0         11. Second or greater order channel       0         12. Artificial ditches are not rated; see discussions in manual       0         13. Hydrology (Subtotal =)       0         14. Presence of Baseflow       0         13. Iron oxidizing bacteria       0         14. Leaf litter       1         15. Sediment on plants or debris       0         16. Organic debris lines or piles       0         17. Soil-based evidence of high water table?	No = 0	1 1 1 0.5 0.5	2 2 2 1 1 Yes = 3	3 3 3 1.5 1.5
5. Depositional bars or benches 7. Recent alluvial deposits 9. Grade control 10. Natural valley 11. Second or greater order channel 1 artificial ditches are not rated; see discussions in manual 13. Hydrology (Subtotal =) 12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 15. Sediment on plants or debris 16. Organic debris lines or piles 17. Soil-based evidence of high water table?	No = 0	1 0.5 0.5 1 1 1 0.5	2 2 1 1 Yes = 3	3 3 1.5 1.5
5. Depositional bars or benches 7. Recent alluvial deposits 9. Grade control 10. Natural valley 11. Second or greater order channel 1 artificial ditches are not rated; see discussions in manual 13. Hydrology (Subtotal =) 12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 15. Sediment on plants or debris 16. Organic debris lines or piles 17. Soil-based evidence of high water table?	No = 0	1 0.5 0.5 1 1 1 0.5	2 1 1 Yes = 3	3 3 1.5 1.5
7. Recent alluvial deposits  8. Headcuts  9. Grade control  10. Natural valley  11. Second or greater order channel  1 artificial ditches are not rated; see discussions in manual  13. Hydrology (Subtotal =)  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?	No = 0	0.5 0.5 1 1 1 0.5	2 1 1 Yes = 3	3 1.5 1.5
B. Headcuts D. Grade control D. Natural valley D. Second or greater order channel D. Artificial ditches are not rated; see discussions in manual D. Hydrology (Subtotal =) D. Second or greater order channel D. Hydrology (Subtotal =) D. D. Second or greater order channel D. Hydrology (Subtotal =) D. D. Second or greater order channel D. Hydrology (Subtotal =) D. D. Second or greater order channel D. Hydrology (Subtotal =) D. D. Second or greater order channel D. Hydrology (Subtotal =) D. D. Second or greater order channel D. Hydrology (Subtotal =) D. D. Second or greater order channel D. Hydrology (Subtotal =) D. D. Second or greater order channel D. D. Second or greater order order channel D. D. Second or greater order order channel D. D. Second or greater order order order channel D. D. Second or greater order order order channel D. D. Secon	No = 0	0.5 0.5 1 1 1 0.5	2 1 1 Yes = 3	1.5
9. Grade control 10. Natural valley 11. Second or greater order channel 1 artificial ditches are not rated; see discussions in manual 13. Hydrology (Subtotal =) 12. Presence of Baseflow 13. Iron oxidizing bacteria 14. Leaf litter 15. Sediment on plants or debris 16. Organic debris lines or piles 17. Soil-based evidence of high water table?	No = 0	1 1 1 0.5	Yes = 3  2 2 0.5	3 3
11. Second or greater order channel  artificial ditches are not rated; see discussions in manual  3. Hydrology (Subtotal =)  12. Presence of Baseflow  13. Iron oxidizing bacteria  14. Leaf litter  15. Sediment on plants or debris  16. Organic debris lines or piles  17. Soil-based evidence of high water table?	No = 0	1 1 1 0.5	Yes = 3  2  2  0.5	3 3
artificial ditches are not rated; see discussions in manual  3. Hydrology (Subtotal =)  12. Presence of Baseflow 0  13. Iron oxidizing bacteria 0  14. Leaf litter 1  15. Sediment on plants or debris 0  16. Organic debris lines or piles 0  17. Soil-based evidence of high water table?	5	1 1 0.5	Yes = 3  2  2  0.5	3
artificial ditches are not rated; see discussions in manual  3. Hydrology (Subtotal =)  12. Presence of Baseflow 0  13. Iron oxidizing bacteria 0  14. Leaf litter 1  15. Sediment on plants or debris 0  16. Organic debris lines or piles 0  17. Soil-based evidence of high water table?		1 0.5	2 2 0.5	3
2. Presence of Baseflow  3. Iron oxidizing bacteria  4. Leaf litter  5. Sediment on plants or debris  6. Organic debris lines or piles  7. Soil-based evidence of high water table?		1 0.5	2 0.5	3
2. Presence of Baseflow  3. Iron oxidizing bacteria  4. Leaf litter  5. Sediment on plants or debris  6. Organic debris lines or piles  7. Soil-based evidence of high water table?		1 0.5	2 0.5	3
4. Leaf litter 5. Sediment on plants or debris 6. Organic debris lines or piles 7. Soil-based evidence of high water table?	5	0.5	0.5	
4. Leaf litter 5. Sediment on plants or debris 6. Organic debris lines or piles 7. Soil-based evidence of high water table?		0.5		0
6. Organic debris lines or piles 0 7. Soil-based evidence of high water table?			1	-
7. Soil-based evidence of high water table?				1.5
		0.5	1)	1.5
Riology (Subtotal - )	(No = 0)		Yes = 3	
5. Biology (Subtotal =)		·		
8. Fibrous roots in streambed 3	3)	2	1	0
9. Rooted upland plants in streambed 3		2	1	0
20. Macrobenthos (note diversity and abundance) 0		1	2	3
21. Aquatic Mollusks 0	)	1	(2)	3
22. Fish 0	) (	0.5	1	(1.5)
23. Crayfish 0	) (	0.5	1	1.5
24. Amphibians 0	) (	0.5	1)	1.5
25. Algae 0	) (	0.5	1)	1.5
6. Wetland plants in streambed	FACV	N = 0.75; OBL = 1.	.5 Other = 0	
*perennial streams may also be identified using other methods. See p. 35	of manual.			
Notes: This field sheet is missing. Information filled out using	g information f	rom two other da	ta points on the	James
River				

		Stre	Uni	fied Stream N	lethodology f	Form	ginia	m 1)			
Project #		Project Name		wadeable chan Locality	Cowardin	HUC	perennial Date	SAR#	Impact/SAR	Impact	
N/A	DC	C2RVA - Area	06	VA	Class. R4	02080205	3/17/2016		length	Factor	
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	l ation						
J. Bu	ıdnik & K. As	stroth			06-S	TR-A-02	2 (Reedy	Creek)			
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream		ondition (erosion,	aggradation)					
	Opt	imal	Subo	ptimal	onditional Catego Mar	ginal	Po	or	Sev	ere	
		WAR OF THE PERSON OF THE PERSO	1			less than Severe or	Overwiden		1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	inks. Vegetative on or natural rock, 100%). AND/OR // bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are stylegetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to riewly develope	ew areas of active ted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR ures contribute to ktfull and low flow II defined. Stream o bankfull benches, of floodplains along each. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe ower bank slopes. resent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sisent, contribute to torming/present.	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. orary/transient in outing to instability.	incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sl Erosion/raw ban	stability. Severe tained within the ed below average hajority of banks ut. Vegetative on less than 20% of eventing erosion. Dughing present. ks on 80-100%.	
	sediment deposition 10% of	on covers less than bottom.	sediment cover	s 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar	on is present on > aks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1		2.4
,		Assess hoth hank	's 100 foot rinaria	n areas along the	entire SAR (ro	uah measuremen	ts of length & wid	h may he accen	table)		
		imal	Con	an areas along the ditional Cate ptimal	gory	ugh measuremen	ts of length & wid		NOTES>>		
Riparian Buffers	Opti Tree stratum (dbh: with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate	gory	Ginal  Low Marginal:  Non-maintained, dense herbaceous vegetation,					
Buffers	Opti Tree stratum (dbh : with > 60% tree c: non-maintained un	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ir iparian areas lacking shrub and tree stratum, hor production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of t	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums iparian qual 100			
Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree conon-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % l	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin Score for each ri 30% 0.75	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 70% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * Si	cores*0.01)/2	
Condition Scores  1. Delineate rip Jescriptors. 2. Determine so Jelow. 3. Enter the % I	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  30%  0.75	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 70% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums iparian qual 100	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	0.58	CI
Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the % Right Bank Left Bank 3. INSTREAL	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 30% 0.75  50% 0.75  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 70% 0.5  40% 0.6  Zes, water velocii	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provinced to the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI > NOTES>>	0.58 0.67	CI 0.62
Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the % Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree ca non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Score >  W HABITAT: Va root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5  each stream ban each by measurin 30% 0.75  50% 0.75  aried substrate si iffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 70% 0.5  40% 0.6  zes, water velocit exes, stable featu	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (In the blocks below 10% 0.5  by and depths; wores.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the rovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 100%  100%	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	0.58 0.67	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the %  Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree conon-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> core >  M HABITAT: Wood mats; SAV; r  Opti Habitat elements a	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 30% 0.75  50% 0.75  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 70% 0.5  40% 0.6  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks ended to the blocks ended	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI > NOTES>>	0.58 0.67	0.6
Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the % Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cz non-maintained un- located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Vi root mats; SAV; r  Opti  Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 30% 0.75  50% 0.75  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 70% 0.5  40% 0.6  Zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Coungth and width. (and the blocks below 1.9  10% 0.5  y and depths; wores.  Conditiona ptimal ments are typically 6 of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the rovided for you  bris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to f % R Blocks end	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI > NOTES>>	0.58 0.67	

	St	ream In	npact A	ssessm	ent For	rm Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4	02080205	3/17/2016	06STR-A02		
	ALTERATION: Stream cross poil piles, constrictions, livestock Negligible		crete, gabions, or  Conditiona	l Category	straightening of ch		ration,	NOTES>> Concrete of	channel.
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel	20-40% of the stream reach is	40 - 60% of reach is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel	Greater than 8 disrupted by an alterations listed guidelines AND/0	30% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or		
		1.3	1.1	0.9	0.7		.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Typical view of stream with pipeline carried over Top Right: Typical view of stream toward Culvert 01 under railroad Bottom Left: Culvert 01 carrying stream under railroad

Bottom Right: Pipe over stream

NC DWQ Stream Identification Form Version 4.11 Reedy Creek 06-STR-A-02

110 B 11 & Stream raemmeation r orm	v CIBIOII IVII	
Date: 3/17/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.510922
Evaluator: J. Budnik, K. Astroth	County: Chesterfield	Longitude: -77.490508
<b>Total Points:</b> 22.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

0	1 1 1	2 2	3 3
0	1		
0	•	2	0
	1		3
		2	3
$\bigcirc$	1	2	3
(0)	1	2	3
0	1	2	3
0	1	2	3
0	0.5	1	1.5
0	0.5	1	1.5
No	0 = 0	Yes =	= 3
0	1	(2)	3
0	1	(2)	3
1.5	1	0.5	0
0	0.5	1	1.5
0	0.5	1	1.5
No.	0 = 0	Yes =	= 3
(3)	2	1	0
(3)	2	1	0
0	1)	2	3
0	1	2	3
8	0.5	1	1.5
(0)	0.5	1	1.5
0	0.5	1	1.5
0	0.5	1	1.5
	FACW = 0.73; C	OBL = 1.5 Other = 0	)
p. 35 of manua	al.		
		18-B-STR-05.	
	0 0 0 0 0 0 1.5 0 0 0 0 0 0	0 1 0 0.5 0 0.5 No = 0  0 1 0 1 1.5 1 0 0.5 0 0.5 No = 0  3 2 0 0.5 No = 0  3 2 0 0 1 0 1 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5	0 1 2 0 0.5 1 No = 0 Yes = 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0.5 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
Project #		Project Name		wadeable chan	nels classified a Cowardin	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact	
•				•	Class.			SAR#	length	Factor	
N/A Nam	e(s) of Evaluat	2RVA - Area		VA e and Informa	R4SB ation	02080205	3/21/2016				
	gering & K. A	. ,				06-STI	R-A-03				
. Channel C	Condition: Asse	ess the cross-sec	tion of the stream			aggradation)					
	Opti	mal	Subo	ptimal c	Conditional Catego Mar	ry ginal	Po	or	Sev	ere	
	1	مويد محلا	Cliability incincal for	and a street		less than Severe or stable than Severe	Overwidene Vertically/laterally		1	5	
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars' are present. Acce floodplain or fully bankfull benches. and transverse be sediment depositio	n or natural rock, 00%). AND/OR bankfull benches iss to their original of developed wide Mid-channel bars, ars few. Transient in covers less than	erosion or unproted of banks are st Vegetative protect prominent (60-Depositional feat stability. The bar channels are wellikely has access to or newly develope portions of the r	ew areas of active ted banks. Majority table (60-80%). tion or natural rock 80%) AND/OR ures contribute to ktfull and low flow Il defined. Stream to bankfull benches, d floodplains along each. Transient \$ 10-40% of the	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran instability. Depositi stability, may be	swer bank slopes. esent on 40-60% of lative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present. ed channels have	widen further. Major are near vertical. E 60-80% of banl protection preser banks, and is insu erosion. AND/DD stream is covere Sediment is temp nature, and contrib AND/OR V-shape vegetative protective	ority of both banks rosion present on cs. Vegetative to n 20-40% of fficient to prevent a 60-80% of the dby sediment. orary/transient in juting to instability, and channels have	banks, is not pre Obvious bank slo Erosion/raw ban	stability. Severe tained within the ad below average hajority of banks ut. Vegetative on less than 20% of eventing erosion. bughing present. ks on 80-100%.	
	10% of	bottom.		bottom.	banks and deposit	on on > 40% of the onal features which to stability.	40% of the ban sediment depos		deposition, contrib Multiple thread of subterran	uting to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1	l	2.0
								TR-01.			
. RIPARIAI	N BUFFERS: A		Con	ditional Cate	gory		ts of length & widt	h may be accep	table)		
RIPARIAI Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	imal  3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.		gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a href="#">yalow</a> inches) present, unter sow tree canopy cover with maintained understory.		h may be accep			
Riparian Buffers	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the	imal 3 inches) present, anopy cover and a derstory. Weltands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/40.700/">30 inches) present, with <a href="https://doi.org/10.100/">30 inches) present</a></a></a></a></a>	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine so	Tree stratum (dbh > with > 60% tree canon-maintained und located within the	imal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  Delineate rip scoriptors. Determine scolow. Enter the %	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	imal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban ach by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100			
Riparian Buffers  Condition Scores  Delineate rip Secriptors. Determine scolow. Enter the %	Tree stratum (dbh > with > 60% tree canon-maintained und located within the	imal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>		
Riparian Buffers  Condition Scores  Delineate rip Secriptors. Determine scolow. Enter the %	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	imal 3 inches) present, anopy cover and a defeatory. Wetlands to riparian areas.  5 beach stream ban ach by measurin Score for each r 70% 0.5	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 30% 0.75	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S		CI
Riparian Buffers  Condition Scores  Delineate rip secriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree cc conon-maintained und located within the located wi	imal 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban ach by measuring Score for each r. 70%	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in 30%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	NOTES>>	cores*0.01)/2 0.58 0.58	CI 0.58
Condition Scores  Delineate rip escriptors. Determine scelow. Enter the % Right Bank  Left Bank  INSTREA	Tree stratum (dbh > with > 60% tree conon-maintained unclocated within the located within	5  sach stream ban ach by measurin 70% 0.5  70% 0.5  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 30% 0.75  30% 0.75  Zes, water velocit	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	ts of length & widt  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ex	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S  Rt Bank Cl >	0.58 0.58	
Condition Scores  Delineate rip secriptors. Determine solow. Enter the % Right Bank  Left Bank  INSTREAL dercut banks; Instream	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	imal  3 inches) present, anopy cover and a dierstory. Wetlands er riparian areas.  5  ach stream ban each by measuring Score for each row 0.5  70%  0.5  arried substrate siffle poole completers.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 30% 0.75  30% 0.75  zes, water velocit exes, stable feature	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	ts of length & widt  Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ex	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>>  C  = (Sum % RA * S  Rt Bank CI >  Lt Bank CI >  NOTES>>	0.58 0.58 eanks and	
Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % Right Bank  Left Bank  INSTREAL	Tree stratum (dbh > with > 60% tree co non-maintained und located within the located with	imal  3 inches) present, anopy cover and a dierstory. Wetlands er riparian areas.  5  5  5  6  6  70%  0.5  70%  0.5  70%  10.5  6  6  70%  10.5  10.5	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 30% 0.75  2es, water velocit exes, stable featur  Subo Stable habitat ele present in 30-50 are adequate fo	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrud layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High 0.85  Calculators are provided at Category Mar Stable habitat ele present in 10-30 are adequate for are dequate for a sea dequate for a se	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	C  = (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>> Concrete b	0.58 0.58 eanks and	

	St	ream Im	pact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX	VA	R4SB	02080205	3/21/2016	06STR-A03			
	ANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, ments, spoil piles, constrictions, livestock  Conditional Category  NOTES>>								
	Negligible	Mir	nor	Mode	erate	Sev	ere	culverts	
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.		y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH C	ONDITION IN	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH		
		The state of the s				The second secon			

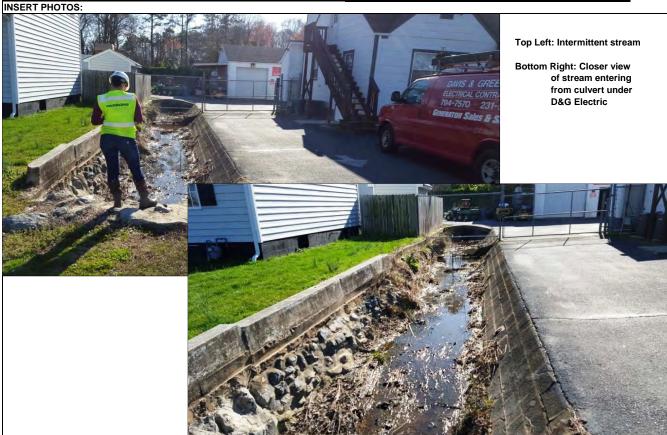
NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF



NC DWQ Stream Identification Form Version 4.11

## 06-STR-A-03

Date: 3/21/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.506110
Evaluator: L. Eggering, K. Astroth	County: Richmond (city)	Longitude: -77.485313
<b>Total Points:</b> 27.25 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 11)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0		2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	9	1	(2)	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual	1			
B. Hydrology (Subtotal = 6.5				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5		1.5
16. Organic debris lines or piles	0	0.5	0	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes :	= 3
C. Biology (Subtotal = $9.75$				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	<b>(1)</b>	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other methods.				
Notes: Stream runs through culverts under railroad	and parking lot	with moderate flo	w. At Brandon Roa	d, the stream
enters into the city stormwater system. Field	Sheet: 18-A-ST	R-01.		
Sketch:    Cul 1   Cul 2	Asphalt	d	Brandon Road	

# Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

		For us	se in ephemeral	streams				
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Area 06	VA	R6	02080206	3/21/2016			
	( ) ( = 1 , ( ) )							

Name(s) of Evaluator(s) Stream Name and Information

06-STR-A-04 L. Eggering & K. Astroth

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

	Conditional Category									
	Optimal	Subo	ptimal	Ma	rginal	Po	oor	Railroad p	arallels	
Riparian Buffers	Tree stratum (dbh > 3 inches) p with > 60% tree canopy cover a non-maintained understory. We areas.	d an to 60% tree	with tree stratum (dbh > 3 inches)	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non- maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Lawns, mowed, and maintained areas, nurseries; no-till cropland;	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	right bank Sheet: 18-	ng the . Field	
		High	Low	High	Low	High	Low			
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5			
	arian areas along each strear	bank into Condition C	Categories and Co	ondition Scores us	sing the	Ensure	the sums			
descriptors.  2. Determine sq below.	uare footage for each by mea	suring or estimating le	ength and width.	Calculators are pr	ovided for you	of % F	Riparian			
<ol><li>Enter the % F</li></ol>	Riparian Area and Score for e	ach riparian category i	n the blocks below	w.		Blocks 6	equal 100			
Right Bank	% Riparian Area> 30%	70%					100%			
ragin bank	Score > <b>0.75</b>	0.5								
								CI= (Sum % RA * \$	,	
Left Bank	% Riparian Area> 40%	20%	40%				100%	Rt Bank CI >	0.58	CI
	Score > 0.6	0.85	1.1					Lt Bank CI >	0.85	0.71

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

THE REACH CONDITION INDEX (RCI) >>	0.36
RCI= (Riparian CI)/2	
COMPENSATION REQUIREMENT (CR) >>	0

CR = RCI X LF X IF

INSERT PHOTOS



Top Right: Confluence of STR-03 (top), and STR-02 (flowing in from bottom right corner) Bottom Left: Typical view of stream adjacent railroad

NC DWQ Stream Identification Form Version 4.11

## 06-STR-A-04

1.5

Date: 3/21/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.496755
Evaluator: L. Eggering, K. Astroth	County: Richmond (city)	Longitude: -77.475697
<b>Total Points:</b> 16.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 6.5)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	ď	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $3.5$				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes	- 3

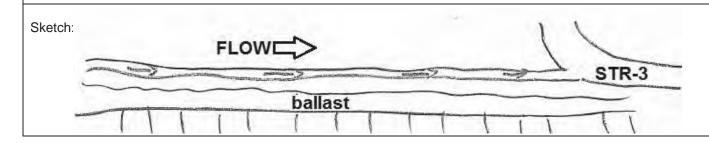
C. Biology (Subtotal = $\underline{6.25}$ )				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	05	1	1.5
24. Amphibians	0	0.5	1	1.5

0.5

26. Wetland plants in streambed FACW = 0.75; OBL = 1.5 Other = 0
\*perennial streams may also be identified using other methods. See p. 35 of manual.

25. Algae

Notes: Stream parallels railroad. Steep eroded banks present. Flows into STR-03. Field Sheet: 18-A-STR-02.



		Stre			ment Methodology f		ı (For	m 1)			
					nels classified a		perennial		Impact/SAR	Impact	
Project #	ı	Project Name	•	Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		DC2RVA - Area 06 VA		R2SB	02080206	3/21/2016					
	e(s) of Evaluator(s) gering & K. Astroth		Stream Nam	e and Informa	ation	OC CT	D A 05				
					No. of the		R-A-05				
. Channel C	ondition: Asse			C	Conditional Catego	ry	_		_		
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	Slightly incised, few areas of active F			less than Severe or stable than Severe	Overwidene Vertically/laterally		Deeply incised	(or executated)			
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	n or natural rock, 00%). AND/OR bankfull benches as to their original developed wide Mid-channel bars, ars few. Transient	sion; 80- ative Vegetative protection or natural I rock, D/OR niches D/OR niches I wide I wide I wide I wide I bars, Insient I consient		Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be isient, contribute on that contribute to forming/present.	60-80% of band protection preset banks, and is insu erosion. AND/OF stream is covere Sediment is temp	rosion present on ks. Vegetative nt on 20-40% of ffficient to prevent R 60-80% of the ed by sediment. corary/transient in buting to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious banks le Erosion/raw ban	stability. Severe tained within the do below average tajority of banks ut. Vegetative on less than 20% of venting erosion. Dughing present. ks on 80-100%.	
	sediment depositio 10% of		sediment cover		AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the bar	on is present on > nks and stable	than 80% of stream deposition, contrib Multiple thread subterran	uting to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1	l	2.0
NOTES>>	Field Sheet: 18-A-STR-03.										
. RIPARIAN	N BUFFERS: A	Assess both bank				ugh measuremen	table)				
	Opti	imal		ditional Cate	gory Marginal		Po	or	NOTES>>	rallala	
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	Railroad parallels stream along right bank.		
			understory.	vegetation).		with <30% tree canopy cover with maintained understory.	condition				
Condition		-	High	Low	High	Low	High	Low	-		
Scores	1.		1.2	1.1	0.85	0.75	0.6	0.5	_		
escriptors.  Determine squelow.	arian areas along o uare footage for e Riparian Area and	ach by measurin	g or estimating le	ngth and width. (	Calculators are pr	•	Ensure the of % R	iparian			
Right Bank	% Riparian Area> Score >	20% 1.1	50% 0.75	30% 0.5				100%			
	% Riparian Area>	20%	50%	30%				100%	CI= (Sum % RA * S Rt Bank CI >	0.75	CI
Left Bank	Score >	1.1	0.85	0.75					Lt Bank CI >	0.87	0.81
	M HABITAT: Va				ody and leafy deb	oris; stable substr	ate; low embeded	lness; shade;	NOTES>>		
	root mats; SAV; ri	inie poole comple	exes, stable reatu	res. Conditiona	l Category						
Instream Habitat/	Opti	mal		ptimal		ginal	Po				
Available Cover	Habitat elements a in greater than 5	re typically present	present in 30-50%	ments are typically 6 of the reach and r maintenance of	present in 10-309	ments are typically % of the reach and or maintenance of	Habitat elements lacking or are ur elements are typica	stable. Habitat			
	_		popul	ations.	popul	ations.	than 10% of	f the reach.			CI
Score	1.	J	1 1	.2	l 0	.9	0.	ບ	1		0.90

	St	ream In	npact A	ssessm	ent Fo	rm Page	e 2		
Project#	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02080206	3/21/2016	06STR-A05		
embankments, spoil piles, constrictions, livestock  Conditional Category								NOTES>> Rip-rap ald	
	Negligible	Mir	Minor		erate	Severe		portion of right bank.	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	y of the channel in the parameter OR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5	]	

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >: RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF



Top Left: Typical view of stream Top Right: Confluence of STR-02 (flowing in from bottom right) and STR-03 (top) Bottom Left: View north from Culvert 03

NC DWQ Stream Identification Form Version 4.11 Broad Rock Creek 06-STR-A-05

Date: 3/21/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.496559
Evaluator: L. Eggering, K. Astroth	County: Richmond (city)	Longitude: -77.475412
<b>Total Points:</b> $32.75$ Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

Absent	Weak	Moderate	Strong
0	1	2	3
0	(1)	2	3
0		2	3
	$\rightarrow$		
_			3
-			3
	1		3
		(2)	3
		2	3
-			1.5
			1.5
No	0 = 0	Yes =	= 3
0	1	(2)	3
0	1	2	3
1.5	1	0.5	0
0	0.5	1	1.5
0	0.5	1	1.5
No	0 = 0	Yes =	= 3
3	<b>(</b> 2 <b>)</b>	1	0
3	2	1	0
0	1_	(2)	3
0	(1)	2	3
0	0.5	1	1.5
0	0.5	1_	1.5
0	0.5	E	1.5
0	0.5		1.5
	FACW = 0.75; C	OBL = 1.5 Other = 0	)
See p. 35 of manua	l.		
resent througho	ut majority of stre	eam. Field Sheet: '	18-A-STR-03
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 0.5 0 0 0.	0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 0 1 2 0 0 1 2 0 0 0.5 1 0 0.5 1 No = 0 Yes =  3 2 1 0 0 1 2 0 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0 0.5 1 0 0 0.5 1 0 0 0.5 1 0 0 0.5 1 0 0 0.5 1 0 0 0.5 1 0 0 0.5 1

		Stre			ment Methodology f		) (For	m 1)			
Dunio et d'		Project Name			nels classified a			CAD#	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A Nom		2RVA - Area		VA e and Informa	R2SB	02080206	3/21/2016				
	e(s) of Evalua gering & K. A	` '	Stream Nam	e and imorni	ation	06-STE	R-A-06a				
	Condition: Asse		etion of the stream	and prevailing c	ondition (erosion		\				
. Onamior e	Opti			C	Conditional Catego		Po	-0"	Sev	·oro	
	У	IIIIai	Suboptimal		Iviai	giriai	1		Jev	//	
	-	We will	Slightly incised, for	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		Deeply incised	(or excavated)	
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully bankfull benches.	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	of banks are si Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope		Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes, esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to	60-80% of bant protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib	rosion present on ks. Vegetative nt on 20-40% of ffficient to prevent R 60-80% of the ed by sediment. corary/transient in buting to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underd	stability. Severe ntained within the ad below average najority of banks tut. Vegetative on less than 20% of eventing erosion. pughing present.	
		on covers less than	ew. Transient portions of the reach. Transient sediment covers 10-40% of the			forming/present. ed channels have ion on > 40% of the ional features which to stability.	AND/OR V-shape vegetative protectic 40% of the bar sediment depos	on is present on > nks and stable	AND/OR Aggradin than 80% of stream deposition, contrib Multiple thread subterran	outing to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1	ı	2.0
NOTES>>				Fi	ield Sheet:	18-A-STR-	04.				
. RIPARIAI	N BUFFERS: A	Assess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt	th may be accep	table)		
			Com								
			Con	ditional Cate	gory				NOTES>>		
				ditional Cate ptimal I		ginal	Po	or	NOTES>>		
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree			Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) presant, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>		
Buffers	Tree stratum (dbh > with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a href="https://doi.org/10.100/journal.com/">30 inches) present, with <a href="https://doi.org/10.100/journal.com/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) present, with <a href="https://doi.org/">30 inches) prese</a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a>	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>>		
	Tree stratum (dbh > with > 60% tree ca	> 3 inches) present, anopy cower and a derstory. Wetlands e riparian areas.	Suboj  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Mar  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>>		
Condition Scores  1. Delineate ripz descriptors. 2. Determine scopelow.	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the	- 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceos and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  andition Scores us Calculators are pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>		
Condition Scores  Delineate ripz escriptors. Determine so elow.	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	-3 inches) present, anopy cover and a destroy. Wellands e riparian areas.  -5  -5  -6  -6  -6  -6  -7  -7  -7  -7  -7  -7	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Lategories and Coungth and width. (in the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  andition Scores us Calculators are pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>		
Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % F	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located within the located areas along of quare footage for e	5 3 inches) present, anopy cover and a derstory. Wetlands er iparian areas.  5 each stream ban each by measurin Score for each r	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Lategories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  andition Scores us Calculators are pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>>  CI≕ (Sum % RA * S	cores*0.01)/2	
Condition Scores  Delineate rip: lescriptors. Determine scelow. Enter the % F	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	5 3 inches) present, anopy cover and a derstory. Wetlands to eriparian areas.  5 each stream ban each by measurin Score for each r 40% 0.75	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 20% 0.6	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Lategories and Congth and width. (and the blocks below 0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  andition Scores us Calculators are pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5		0.62	CI
Condition Scores  Delineate rips lescriptors. Determine so- lescriptors. Enter the % I	Tree stratum (dbh > with > 60% tree cc non-maintained unclocated within the located withi	-3 inches) present, anopy cover and a derstory. Wetlands derstory. Wetlands e riparian areas.  -5  -5  -6  -6  -6  -6  -7  -7  -7  -7  -7  -7	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous are non-maintained understory.  High 1.2  k into Condition C g or estimating le	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. (and the blocks below 40% 0.5	Mar  High Marginal: Non-maintained, sequetation with either a shrub layer or a tree layer (dbh > s al inches) dree canopy cover.  High  0.85  Indiction Scores us Calculators are pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present tree stratum (dbh > 3 inch	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	C⊫ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >		CI 0.71
Condition Scores  Delineate ripe escriptors. Determine sceletow. Enter the % F Right Bank  Left Bank  B. INSTREAF	Tree stratum (dbh > with > 60% tree conon-maintained middle in located within the located	5 3 inches) present anopy cover and a derstory. Wetlands the riparian areas.  5 each stream ban each by measurin Score for each r 40% 0.75  30% 0.75  aried substrate si	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 20% 0.6  30% 0.85  izes, water velocit	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  categories and Co ngth and width. ( n the blocks below 40% 0.5	Mar  High Marginal: Non-maintained, sequetation with either a shrub layer or a tree layer (dbh > s al inches) dree canopy cover.  High  0.85  Indiction Scores us Calculators are pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present tree stratum (dbh > 3 inch	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	CI= (Sum % RA * S Rt Bank CI >	0.62	
Condition Scores  Delineate ripulescriptors. Determine sceledw. Enter the % F Right Bank  Left Bank  Left Bank  INSTREAL	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	-3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  -5  -5  -6  -6  -6  -7  -7  -7  -7  -7  -7  -7	Subol  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 20% 0.6  30% 0.85  izes, water velocit exes, stable feature	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Sategories and Co ngth and width. ( n the blocks below 0.5  15% 1.1  y and depths; wores. Conditiona	High Marginal: Non-maintained, Vegetation with either a shrub layer or a tree layer or a tree layer or a tree layer or a tree canopy cover.  High 0.85  Calculators are pr	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, twee stratum (dbh >3 inches) present, tree stratum (dbh >3 inches) present. The	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	C⊫ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	0.62	
Condition Scores  Delineate ripi descriptors. Descriptors	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	5 3 inches) present anopy cover and a derstory. Wetlands the riparian areas.  5 each stream ban each by measurin Score for each r 40% 0.75  30% 0.75  aried substrate si	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous herbaceous understory.  High  1.2  k into Condition C g or estimating le iparian category in 20% 0.6  30% 0.85  izes, water velocit exes, stable featu	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. ( n the blocks below 40% 0.5	High Marginal: Non-maintained, wegetation with either a shrub layer or a tree layer (short) and the cannot be short to the cannot be shor	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present tree stratum (dbh > 3 inch	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	C⊫ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	0.62	
Condition Scores  Delineate rips descriptors. Ender the % I Right Bank  Left Bank  Left Bank  Instream	Tree stratum (dbh > with > 60% free cc non-maintained und located within the located with	-3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  -5  -5  -6  -6  -6  -6  -7  -7  -7  -7  -7  -7	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating lee parian category in 20% 0.6  30% 0.85  Izes, water velocit exes, stable featur Subop Stable habitat ele present in 30-509 are adequate fo	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. (and the blocks below 40% 0.5  15% 1.1  Ly and depths; wo res.  Conditional	High Marginal: Non-maintained, wegetation with either a shrub layer or a tree layer (dbh > sainches) for the canopy cover.  High 0.85  Indicate the canopy cover.  All the canopy cover.  25% 0.6  Odd and leafy det all Category Mar  Stable habitat ele present in 10-30 are adequate for annathance.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you  pris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tf  of % R  Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%  100%	C⊫ (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	0.62	

	St	ream In	npact A	ssessm	ent Fo	rm Pag	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX	VA	R2SB	02080206	3/21/2016	06STRA06a			
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock  Conditional Category									
	Negligible	Mir	nor		erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF



**NC DWQ Stream Identification Form Version 4.11** 

## 06-STR-A-06a

Date: 3/21/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.496136
Evaluator: L. Eggering, K. Astroth	County: Richmond (city)	Longitude: -77.474873
<b>Total Points:</b> $35.75$ Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 17	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	lo = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual	•			
B. Hydrology (Subtotal = 6				_
12. Presence of Baseflow	0	1	2	(3)

0	1	2	3
0	1	(2)	3
1.5	1	0.5	0
0	0.5	1	1.5
0	0.5	1	1.5
N	0 = 0	Yes:	= 3
	0	0 0.5	0 0.5 1 0 0.5 1

C. Biology (Subtotal = 12.75

18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5	$\Theta$	1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.73;	OBL = 1.5 Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream flows parallel to railroad. Flows under railroad via Culvert 3. Field Sheet: 18-A-STR-04.

Sketch:

STR-03

Cul-3

Sand terrace

bar

		Otic	am A		lethodology f		_				
					nels classified a				I	la.	
Project #	I	Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A		2RVA - Area		VA	R2SB3	02080206	3/22/2016				
	e(s) of Evalua gering & K. A		Stream Nam	e and Informa	ation	06-STE	R-A-06b				
	Condition: Asse		tion of the stream	and prevailing of	andition (erasion		1-A-00D				
. Chainlei C	Optimal				onditional Category		Do an				
	Opti	mai	Subo	ptimai	Iviar	Marginal Po		or	Sev	ere	
	1	WA MARKET TO THE SERVICE OF THE SERV	3		Often incised, but	less than Severe or	Overwidene	ed/incised.	1	5	
Channel Condition	surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or full) bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	ew areas of active tet danks. Majority table (60-80%). tion or natural rock-80%) AND/OR ures contribute to ktfull and low flow II defined. Stream o bankfull benches, of floodplains along each. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe ewer bank slopes. seent on 40-60% of tative protection on Streambanks may creat. AND/OR 40- h is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maji are near vertical. E 60-80% of banl protection preses banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contril	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the bed by sediment. orary/transient in outing to instability.	incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sl Erosion/raw ban	stability. Severe tained within the do below average tajority of banks ut. Vegetative in less than 20% of venting erosion. Dughing present. ks on 80-100%.	
	sediment deposition 10% of		sediment cover	s 10-40% of the bottom.	stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.		AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.		AND/OR Aggrading channel, Greate		•
Score	3	1	2	.4		2	1.	6	1		2
NOTES>> 2. RIPARIAI	N BUFFERS: A	Assess both bank	s's 100 foot riparia			A-STR-04 [		h may be accep	table)		
			Con	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt		table)		
	Opti	mal  3 inches) present, unopy cover and a lerstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or lother comparable conditions.			
2. RIPARIAI Riparian Buffers Condition	Opti Tree stratum (dbh > with > 60% tree cr	mal 3 inches) present, nopy cover and a derstory. Weltands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 2. Determine scorelow.	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th	mal  3 inches) present, nopy cover and a letrestory. Weltands e riparian areas.  5  ach stream ban ach by measurin Score for each rit 50%	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 10%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores 1. Delineate ripedescriptors. 2. Determine scoelow. 3. Enter the % I	Tree stratum (dbh : with > 60% tree cc non-maintained una located within the located with	mal  3 inches) present, nopy cover and a letrstory. Wellands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both abrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. Congth and width	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums ipparian qual 100		cores*0.01)/2	
Riparian Buffers  Condition Scores 1. Delineate ripedescriptors. 2. Determine scoelow. 3. Enter the % I	Tree stratum (dbh : with > 60% tree cc non-maintained und located within the located with	mal  3 inches) present, nopy cover and a learstory. Wetlands or iparian areas.  5  beach stream ban ach by measurin  50%  1.1  30%	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. Congth and width	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us Calculators are present.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  ne sums ipparian qual 100	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	0.84	
Condition Scores  1. Delineate rip- Jescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh : with > 60% tree cc non-maintained una located within the located with	mal  3 inches) present, nopy cover and a learstory. Wetlands or iparian areas.  5  beach stream ban ach by measurin  50%  1.1  30%  1.1  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.85	In areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbin > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth an	Be entire SAR. (rongory  Mary  High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dh) > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prove	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with amaintained understory.  Low  0.75 sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si		
Condition Scores  1. Delineate rip- Jescriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	mal  3 inches) present, unopy cover and a leterstory. Wetlands er riparian areas.  5  sach stream ban ach by measurin  50%  1.1  30%  1.1  aried substrate siffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.85  15% 0.85  zes, water velocit exes, stable feature	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Coungth and width. Coungth and width. Coungth and width. Coungth and width. Coungth and width. Coungth and depths; wores.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provious and leafy det al Category	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure ti  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, conditions.  Low 0.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	0.84	0.
Condition Scores  L. Delineate rippedescriptors. Left Bank  Left Bank  Left Banks.  Instream Habitat/	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th  1. arian areas along the strategy of the stratum (dbh : strategy of the strategy	mal  3 inches) present, nopy cover and a letrstory. Wetlands eriparian areas.  5  each stream ban ach by measurin  Score for each ri  50%  1.1  30%  1.1  aried substrate si ffle poole comple	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.85  15% 0.85  zes, water velocit exes, stable featur  Suboo Stable habitat elei	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbin > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth an	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt  of % R Blocks ed  Blocks ed  High  Deliver to the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	0.84	
Condition Scores  1. Delineate rip: descriptors. 2. Determine scoelow. 3. Enter the % I Right Bank  Left Bank 3. INSTREAI undercut banks; Instream	Tree stratum (dbh with > 60% tree canon-maintained un located within the located within t	mal  3 inches) present, unopy cover and a deterstory. Wetlands er riparian areas.  5  ach stream ban ach by measurin 50% 1.1 30% 1.1 aried substrate si fffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.85  15% 0.85  zes, water velocit exes, stable featur  Subo  Stable habitat ele present in 30-50% are adequate fo	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and depths; wores.  Conditiona ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-fill cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >  NOTES>>	0.84	

	St	ream In	npact A	ssessm	ent For	m Pag	e 2		
Project #	Applicant	Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor	
N/A	CSX	VA	R2SB3	02080206	3/22/2016	06STRA06b			
	. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, mbankments, spoil piles, constrictions, livestock								
	Negligible	Mir	Conditiona nor		erate	Sev	rere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	disrupted by an alterations listed	in the parameter OR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH C	ONDITION II	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: Typical view of stream along railroad, facing south Top Right: Typical view of stream

Bottom Left: Typical view of stream in forested area

Bottom Right: Culvert 08 entering from northeast, facing upstream

NC DWQ Stream Identification Form Version 4.11

## 06-STR-A-06b

Date: 3/21/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.488879
Evaluator: L. Eggering, K. Astroth	County: Richmond (city)	Longitude: -77.468842
<b>Total Points:</b> $35.75$ Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 17	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence	0	ı		3
4. Particle size of stream substrate	0		(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	o = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual	•			
B. Hydrology (Subtotal = 6 )				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0 -	0.5	(1)	1.5
17. Soil-based evidence of high water table?		0 = 0	Yes	
C. Biology (Subtotal = 12.75 )				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1_	(2)	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5		1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed			OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method	ods. See p. 35 of manua			
Notes: Bedrock present at this data point. Strong			ced area contains	equipment.
Field Sheet: 18-A-STR-04 Data pt 2.	,	- p		1.1.
Sketch: < × × × × × × ×	+ * K	· 6 +	fence	9
The state of the s	The second processor of the	HATEL THE RESERVE OF SERVE	No representative properties	Andreas Andreas and the first
		The according	The state of the s	
that a control of the state of	moss lin	ed banks	A MARK THE PARTY OF THE PARTY O	bedrock
Teneral Interests and the second second second second	I The second sec	made the property of the same and the		Journal
	1	L	(	1

# Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

		For u	se in ephemeral s	streams				
Project # Project Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Area 06	VA	R2	02080206	3/22/2016			

Name(s) of Evaluator(s) Stream Name and Information

L. Eggering & K. Astroth

06-STR-A-07

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Co	nditional Cate	egory				NOTES>>	
	Optimal	Subo	ptimal	Ma	rginal		oor	Pipe/Mater	ials vard
Riparian Buffers	Tree stratum (dbh > 3 inches) prese with > 60% tree canopy cover and a non-maintained understory. Wetlan areas.	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60%	3 inches) present, with >30% tree canopy cover and a	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non- maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		
		High	Low	High	Low	High	Low		
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5		
Delineate ripa	rian areas along each stream ba	k into Condition Cat	egories and Cond	ition Scores using	the descriptors.	Ensure the sums			
2. Determine squ	uare footage for each by measuri	ng or estimating leng	th and width. Cal	culators are provi	ded for you below.	of % F	Riparian		
3. Enter the % R	iparian Area and Score for each	iparian category in t	he blocks below.			Blocks e	qual 100		
Right Bank	% Riparian Area> 60%	20%	20%				100%		
	Score > 1.1	0.85	0.5						
								Cl= (Sum % RA * S	
Left Bank	% Riparian Area> 40%	60%					100%	Rt Bank CI >	0.93
	Score > <b>0.85</b>	0.5						Lt Bank CI >	0.64

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

0.40 RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



NC DWO Stream Identification Form Version 4.11

## 06-STR-A-07

Date: 3/21/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.485321
Evaluator: L. Eggering, K. Astroth	County: Richmond (city)	Longitude: -77.466516
<b>Total Points:</b> 18.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = $8.5$ )	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	$\mathcal{L}$	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $3.5$ )				
12 Presence of Baseflow	0	(1)	2	3

12. Presence of Baseflow	0	1)	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	= 3

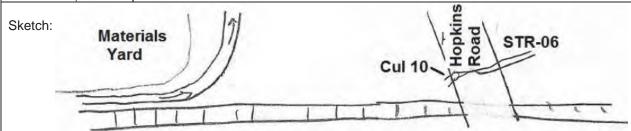
C. Biology (Subtotal = 6.25)

0. 2.0.0gy (Gabicia:				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream runs along property that access was not allowed. Runs parallel to railroad for majority of reach. Little

flow, 1-2" deep. Field Sheet: 18-A-STR-05.



		Stre		SSESS fied Stream M			(For	m 1)			
			For use in	wadeable chan	nels classified a	s intermittent or	perennial		Impact/SAR	Impost	
Project #	I	Project Name	•	Locality	Class.	HUC	Date	SAR#	length	Impact Factor	
N/A		2RVA - Area		VA	R4SB3	02080206	3/22/2016				
	e(s) of Evalua	` '	Stream Nam	e and Informa	ation	OC CTI	D A 00				
	gering & K. A						R-A-08				
Channel C	Condition: Asse	ess the cross-sec		C	ondition (erosion, onditional Catego						
	Opti	imal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	1	Who have	Slightly incised, fu	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		Deeply incised	(or excavated)	
Channel Condition	100% stable bar surface protection prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse bar	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60-Depositional feat stability. The bar channels are wellikely has access to or newly develope portions of the r	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient	Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Sed temporary/tran instability. Deposition stability, may be	ower bank slopes. esent on 40-60% of lative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present. ed channels have	widen further. Majo are near vertical. 60-80% of bank protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape vegetative protective	rosion present on ks. Vegetative nt on 20-40% of fficient to prevent 8 60-80% of the do by sediment. corary/transient in justing to instability. do channels have	vertical/lateral in: incision, flow con banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious bank sic Erosion/raw ban AND/OR Aggrading	stability. Severe tained within the 4d below average lajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%. g channel. Greater	
	10% of	bottom.		rs 10-40% of the bottom.	vegetative protecti banks and depositi	ion on > 40% of the ional features which to stability.	40% of the ban sediment depos	iks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	uting to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1		2.4
							06.				
. RIPARIAI	N BUFFERS: A	Assess both bank				ugh measuremen		h may be accep	1		
. RIPARIAI	N BUFFERS: /		Con	an areas along the ditional Categorial	gory	ugh measuremen			NOTES>>	nad bridge	
RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate	gory		ts of length & widt	or	1	stream. ge	
Riparian Buffers	Opti Tree stratum (dbh - with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> Hopkins Ro goes over s Under brid	stream. ge	
Riparian Buffers	Opti Tree stratum (dbh - with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wellands eriparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or or other comparable conditions.	NOTES>> Hopkins Ro goes over s Under brid	stream. ge	
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scoelow.	Tree stratum (dbh: with > 60% tree conon-maintained unclocated within the  1.  arian areas along in quare footage for e	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Hopkins Ro goes over s Under brid	stream. ge	
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow.	Tree stratum (dbh : with > 60% tree conon-maintained un located within th	imal  - 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  -5  -5  -6  -6  -6  -6  -6  -6  -6  -6	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>> Hopkins Ro goes over s Under brid vegetation	stream. ge is sparse.	
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scolow. Enter the % I	Tree stratum (dbh a with > 60% tree cc non-maintained una located within the located with	imal  3 inches) present, anopy cover and a derstory. Wellands e riparian areas.  5  each stream ban each by measuring Score for each r 50%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in 50%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Hopkins Ro goes over s Under brid	stream. ge is sparse.	CI
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scolow. Enter the % I	Tree stratum (dbh : with > 60% tree cc on non-maintained und located within the located w	imal  3 inches) present, anopy cover and a derstory. Wetlands the riparian areas.  5  each stream ban each by measurin Score for each r 50% 1.1	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.85	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	NOTES>> Hopkins Rogoes over sunder brid vegetation	stream. ge is sparse.	CI 0.84
Riparian Buffers  Condition Scores  Delineate ripsecriptors. Determine solow. Enter the % I	Tree stratum (dbh : with > 60% tree conon-maintained und located within th  1. arian areas along to a stratum areas along to a stratum areas along to a stratum area and % Riparian Area > Score > M HABITAT: Va	imal  3 inches) present anopy cover and a derstory. Wetlands derstory. Wetlands er iparian areas.  5  each stream ban each by measurin  Score for each r  50%  1.1  40%  0.85  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.85	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the control of the con	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> Hopkins Rogoes over sunder brid vegetation  Cl= (Sum % RA * South Rough Roger Roge	stream. ge is sparse.	
Riparian Buffers  Condition Scores  Delineate rips scriptors. Determine scolow. Enter the % I	Tree stratum (dbh swith > 60% tree canon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  50% acch stream ban each by measuring Score for each rough 1.1  40% 0.85 aried substrate si iffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.85	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tf  of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 10.5  L	NOTES>> Hopkins Rogoes over sunder bridge that ion  Cl= (Sum % RA * South Roug	stream. ge is sparse.	
Riparian Buffers  Condition Scores  Delineate ripescriptors  Determine scelow Enter the % I Right Bank  Left Bank  INSTREAI Indercut banks; Instream Habitat/	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th  1. arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  M HABITAT: Va root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands to riparian areas.  5  each stream ban each by measurin Score for each r 50% 1.1  40% 0.85 arried substrate si iffle poole completimal	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.85  60% 0.6  zes, water velocit exes, stable featur  Subo Stable habitat elei	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the condition of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks ed  Blocks ed  Attack of the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  100%  100%	NOTES>> Hopkins Rogoes over sunder bridge that ion  Cl= (Sum % RA * South Roug	stream. ge is sparse.	
Riparian Buffers  Condition Scores  Delineate riplescriptors. Determine scelow. Right Bank Left Bank B. INSTREAI	Tree stratum (dbh : with > 60% tree cc non-maintained und located within th  1. arian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  M HABITAT: Va root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  50% ach by measuring Score for each reach by measuring Score for each reach anopy cover and a derstory.  40% 0.85 arried substrate siffle poole completimal re typically present	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.85  60% 0.6  zes, water velocit exes, stable featur  Suboy Stable habitat ele present in 30-50% are adequate fo	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/">https://doi.org/10.100/j.nc/</a> High  0.85  Indition Scores us Calculators are proved and leafy determined by and leafy determined by and leafy determined by and leafy determined by and leafy determined by and leafy determined by and leafy determined by and leafy determined by and leafy determined by and leafy determined by a stable habitat elepresent in 10-30% are adequate for a tree of the present i	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ex	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	NOTES>> Hopkins Rogoes over sunder bridge that ion  Cl= (Sum % RA * South Roug	stream. ge is sparse.	

Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB3	02080206	3/22/2016	06STR-A08		
	HANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, nkments, spoil piles, constrictions, livestock  Conditional Category								
	Negligible	Mi	nor	Mod	erate	Sev	rere		
Channel Alteration	or hardening absent. Stream has an	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in the parameter guidelines. If	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	OR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### **INSERT PHOTOS:**



Typical view of stream

NC DWO Stream Identification Form Version 4.11

## 06-STR-A-08

Date: 3/21/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.484482
Evaluator: L. Eggering, K. Astroth	County: Richmond (city)	Longitude: -77.465799
<b>Total Points:</b> 26.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

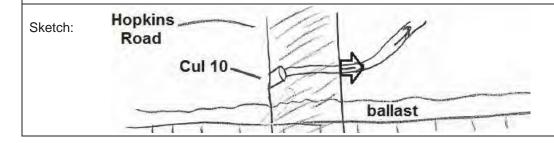
" = 10 01 pereriman " = 00				
A Coomernhology (Cultivated 12.5	Absent	Weak	Moderate	Strong
A. Geomorphology (Subtotal = 12.5		vveak	Woderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	$\mathfrak{L}$	2	3
5. Active/relict floodplain	0	Ð	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	$\left( -\right)$	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 6				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5

17. Soil-based evidence of high water table? No = 0 Yes = 3C. Biology (Subtotal = 8.25

18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream originates at Culvert 10 and flows under Hopkins Road. Field Sheet: 18-A-STR-06.



		Stre	Unit	fied Stream M	lethodology f	Form	ginia	m 1)			
Project #		Project Name		Locality	nels classified a Cowardin Class.	HUC	perennial Date	SAR#	Impact/SAR Impact Iength Factor		
N/A	DC	C2RVA - Area	06	VA	R2SB3	02080206	3/22/2016		lengui	ractor	
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation		L	l			
L. Eg	gering & K. A	Astroth		06-STR-A-09							
1. Channel (	Condition: Asse	ess the cross-sec	tion of the stream								
	Optimal		Subo	ptimal	onditional Catego Mar	ginal	Po	or	Sev	ere	
	The state of the s		1			less than Severe or	Overwiden		1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	inks. Vegetative in or natural rock, 100%). AND/OR /bankfull benches less to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	ew areas of active total banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, of floodplains along reach. Transient	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe ower bank slopes. resent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sisent, contribute to torming/present.	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. orary/transient in buting to instability.	incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sl Erosion/raw ban	stability. Severe tained within the de below average hajority of banks ut. Vegetative on less than 20% of venting erosion. Dughing present. ks on 80-100%.	
		on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar	on is present on > nks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	С
Score		3	2	4		2	1.	6	1	l	2.4
Z. KIPAKIAI	N BUFFERS: /										
		imal	Con	an areas along the ditional Cate ptimal	gory	ugh measuremen	ts of length & wide		NOTES>>		
Riparian Buffers	Opti Tree stratum (dbh: with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	ditional Cate	gory	Ginal  Low Marginal:  Non-maintained, dense herbaceous vegetation,					
Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cr. non-maintained un	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ir iparian areas lacking shrub and tree stratum, hor production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leeparian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strategy of the conon-maintained un located within the strategy of t	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leeparian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100		cores*0.01)/2	
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  20%  0.85	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.75	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	0.62	CI
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREA	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 20% 0.85  30% 0.85  aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.75  70% 0.6	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nes/">https://doi.org/10.100/j.nes/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >  NOTES>>	0.62	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREA	Tree stratum (dbh: with > 60% tree ca non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Score >  W HABITAT: Va root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5  each stream ban each by measurin 20% 0.85  30% 0.85  aried substrate si iffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.75  70% 0.6  zes, water velocit exes, stable feature	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 60% 0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are prov.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the rovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed olots, trailport of the conditions.  Low 0.5  Low 100%  100%	CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI > NOTES>> Lots of tras	0.62 0.68 sh in	
Condition Scores  1. Delineate rip descriptors. 2. Determine st below. 3. Enter the % Right Bank  Left Bank  3. INSTREA undercut banks Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree conon-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> core >  M HABITAT: Wood mats; SAV; r  Opti Habitat elements a	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 20% 0.85  30% 0.85  aried substrate si iffle poole completimal are typically present	Con Suboy High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.75  70% 0.6  zes, water velocit exes, stable featur  Suboy Stable habitat ele present in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 60% 0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitat ele present in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the rovided for you  bris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en  Attention of the comparable condition of the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed older conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >  NOTES>>	0.62 0.68 sh in	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREA undercut banks Instream Habitat/	Tree stratum (dbh: with > 60% tree cz non-maintained un- located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  W HABITAT: Vi root mats; SAV; r  Opti  Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 20% 0.85  30% 0.85  aried substrate si iffle poole completimal are typically present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.75  70% 0.6  Zes, water velocit exes, stable featur  Subo Stable habitat ele present in 30-50% are adequate fo popul	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 0.5  ty and depths; wo res.  Conditional ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the rovided for you  bris; stable substrations are typically ments are	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to f % R Blocks end	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  he sums iparian qual 100  100%  100%  Iness; shade;	C  = (Sum % RA * Si Rt Bank CI > Lt Bank CI > NOTES>> Lots of tras Channel. Vo	0.62 0.68 sh in	CI 0.6:

	St	ream In	npact A	ssessm	ent Fo	rm Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX	VA	R2SB3	02080206	3/22/2016	06STR-A09			
B. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, mbankments, spoil piles, constrictions, livestock  Conditional Category  NOTES									ed.
	Negligible	Mir	nor		erate	Sev	rere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/C shored with ga cerr	y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH C	ONDITION II	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: Culvert 12, start of STR-07
Top Right: Typical view of stream
Bottom Left: Culvert 14, carrying stream under railroad
Bottom Right: Culvert 15

NC DWQ Stream Identification Form Version 4.11

### 06-STR-A-09

Date: 3/22/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.479993
Evaluator: L. Eggering, K. Astroth	County: Richmond (city)	Longitude: -77.462696
<b>Total Points:</b> 31.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitted Perennial	Other e.g. Quad Name:

il 2 19 0i perennarii 2 30				
A Coomarphology (Subtotal 12.5	Absent	Weak	Moderate	Strong
A. Geomorphology (Subtotal = 12.5 )  1 <sup>a.</sup> Continuity of channel bed and bank	0	4 VVGaR	2	3
				3
2. Sinuosity of channel along thalweg	0	-	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0		2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = <u>7.5</u> )				T
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	=0	Yes:	= 3
C. Biology (Subtotal = 11.25)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
			†	

21. Aquatic Mollusks 0 3 22. Fish 0 1.5 1 23. Crayfish 0 1.5 24. Amphibians 0 1.5 1 25. Algae 0 0.5 1.5

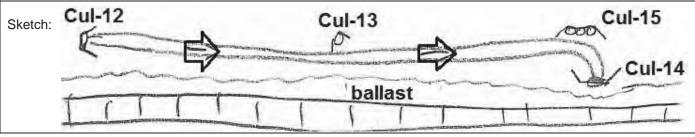
\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream depth is 4-6". Very low flow. Algae is present throughout. Lots of trash in stream channel (polluted).

FACW = 0.7; OBL = 1.5 Other = 0

Field Sheet: 18-A-STR-07.

26. Wetland plants in streambed



		Stre	eam A	sses	sment	Form	(Forr	n 1)			
			Un	ified Stream	Methodology f	or use in Virgi	nia	,			
					nnels classified a		perennial		Impact/SAR	Impact	
Project #	ı	Project Name	•	Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R4SB3	02080206	3/22/2016				
	e(s) of Evaluat pering & K. A	` '	Stream Name	e and Informa	ation	06-STF	λ 10				
			for the store		Pd / t		K-A-10				
i. Channei C					ondition (erosion, a	ry					
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or	Se	vere	
		مويد مولا	Slightly incised, fr	ew areas of active		less than Severe or table than Severe or	Overwiden: Vertically/laterally		1	5	
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-1 Stable point bars/l are present. Acce floodplain or fully bankfull benches. and transverse ba sediment depositio	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches as to their original of developed wide Mid-channel bars, ars few. Transient in covers less than	Vegetative protect prominent (60- Depositional feat stability. The ban channels are wel likely has access to or newly developer portions of the re	table (60-80%). tion or natural rock -80%) AND/OR	may be present of banks. Vegetative p of banks. Streambal undercut. AND/OR covered by sedimer temporary/transient, Deposition that comay be forming/pishaped channel protection on > 40	ank slopes. Erosion in 40-60% of both rotection on 40-60% of both rotection on 40-60% with smay bevertical or 40-60% of stream is int. Sediment may be contribute instability, intribute to stability, resent. AND/OR V-seemt. AND/OR V-by of the banks and	banks, and is insu erosion. AND/Of stream is covere Sediment is temp nature, and contrik AND/OR V-shap vegetative protecti	rosion present on ks. Vegetative nt on 20-40% of ffficient to prevent R 60-80% of the ed by sediment. orary/transient in outing to instability. de channels have on is present on >	vertical/lateral ir incision, flow co banks. Streamb rooting depth, r vertical/under protection present banks, is not pro Obvious bank si Erosion/raw bai	(or excavated), stability. Severe ntained within the ed below average majority of banks cut. Vegetative on less than 20% of eventing erosion. loughing present. nks on 80-100%. Ig channel. Greater	
	10% of I	bottom.	stream	bottom.		s which contribute to pility.	40% of the bar sediment depos		than 80% of stream deposition, contril Multiple thread	n bed is covered by buting to instability. channels and/or	CI
Score	3	3	2	.4	:	2	1.	6		nean flow. 1	2.4
NOTES>>			l.	-	ield Sheet:	18. <b>Δ.</b> STR.0	8		JI.		
2. RIPARIAN	N BUFFERS: A	Assess both bank	s's 100 foot riparia	in areas along the	e entire SAR. (rough	gh measurements	of length & width	may be accepta	ble)		
				nditional Cate			_		NOTES>>		
	Opti	mal	High Suboptimal: Riparian areas with tree stratum	Low Suboptimal: Riparian areas with tree stratum		Low Marginal: Non-maintained, dense herbaceous vegetation, riparian	High Poor: Lawns, mowed, and maintained areas, nurseries;	Low Poor: Impervious			
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	anopy cover and a derstory. Wetlands	(dbh > 3 inches) present, with 30% to 60% free canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	(dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	dense herbaceous vegetation with either a shrivbl layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.		surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
			High	Low	High	Low	High	Low			
Condition Scores	1.	5	1.2	1.1	0.85	0.75	0.6	0.5	]		
lescriptors. !. Determine squelow.	-	ach by measurin	g or estimating le	ngth and width. (	ondition Scores using Calculators are pro	-	Ensure the of % R	iparian			
Right Bank	% Riparian Area>	50%	10%	40%				100%			
	Score >	1.1	0.85	0.5					CI= (Sum % RA * S	Scores*0.01)/2	
Left Bank	% Riparian Area>	30%	60%	10%				100%	Rt Bank CI >	0.84	CI
	Score >	1.1	0.85	0.5					Lt Bank CI >	0.89	0.86
	// HABITAT: Va			res.	ody and leafy debr	is; stable substrate	e; low embededne	ess; shade;	NOTES>>		
Instream	Opti	imal	Subo	Condition ptimal	al Category Mar	ginal	Po	or	-		
Habitat/ Available	Habitat elements a	re typically present	Stable habitat eler present in 30-50%	ments are typically 6 of the reach and	Stable habitat ele present in 10-30%	ments are typically of the reach and are	Habitat elements lacking or are ur	listed above are stable. Habitat			
Cover	in greater than 50		popula	r maintenance of ations.	popul	naintenance of ations.	elements are typica than 10% of	f the reach.	1		CI
Score	1.	.5	1.	.2	1 0	.9	0.	<del>o</del>	I		0.90

	St	tream Ir	npact A	ssessm	ent For	m Page	2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R4SB3	02080206	3/22/2016	06STR-A10		
	. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, mbankments, spoil piles, constrictions, livestock								
	Negligible	Mir	nor	al Category Mod	erate	Sev	rere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	disrupted by any of the channel alterations listed in the parameter guidelines. If stream	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	disrupted by an alterations listed guidelines AND/0	10% of reach is y of the channel in the parameter JR 80% of banks bion, riprap, or eent.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Typical view of stream

**NC DWQ Stream Identification Form Version 4.11** 

## 06-STR-A-10

Date: 3/22/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.471333
Evaluator: L. Eggering, K. Astroth	County: Richmond (city)	Longitude: -77.456937
<b>Total Points:</b> 22.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemera Intermittent Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*				
A. Geomorphology (Subtotal = 10.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0		2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0		2	3
ripple-pool sequence	-			
4. Particle size of stream substrate	0	$\rightarrow$	2	3
5. Active/relict floodplain	0	<u> </u>	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1)	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $5.5$				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	(No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 6.75				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0_	(1)	2	3
21. Aquatic Mollusks	6)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1_	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; C	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other method	ds. See p. 35 of manua	al.		
Notes: Stream parallels Warwick Road and flows			tland out of study a	area. Field
Sheet: 18-A-STR-08.			•	
Sketch:	Cul-17	Manuick		

		Stre		ified Stream I	Methodology 1	for use in Virgi	inia				
Project #	ı	Project Name		Locality	Cowardin Class.	HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	06	VA	R2SB3	02080205	3/22/2016		lengin	1 actor	
Nam	ne(s) of Evaluat	tor(s)	Stream Name	e and Informa	ation						
L. Eg	gering & K. A	stroth			06-ST	ΓR-A-11	(Grindall	Creek)			
1. Channel (	Condition: Asse	ess the cross-sec	tion of the stream								
	Opti	ptimal Suboptimal		Conditional Catego Mar	rginal	Po	or	Sev	ere		
						less than Severe or stable than Severe or	Overwiden Vertically (laterally		1	5	
Channel Condition	Very little incision of 100% stable bar surface protection prominent (80-11 Stable point bars/l are present. Acce floodplain or fully bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches as to their original developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The ban channels are wel likely has access to or newly develope	ew areas of active cted banks. Majority table (60-80%). Ition or natural rock-80%) AND/OR ures contribute to hkfull and low flow II defined. Stream to bankfull benches, d floodplains along	Poor due to lov Erosion may be pi both banks. Vegeta 60% of banks. S bevertical or unda 60% of stream is c Sediment may be contribute instabi contribute to s	wer bank slopes. resent on 40-60% of attive protection on 40- Streambanks may ercut. AND/OR 40- overed by sediment. temporary/transient, ility. Deposition that stability, may be AND/OR V-shaped	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/OI stream is covere Sediment is temp nature, and contril AND/OR V-shapp	ority of both banks rosion present on cs. Vegetative on 20-40% of fficient to prevent a 60-80% of the bd by sediment. orary/transient in outing to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sla	stability. Severe intained within the ad below average hajority of banks ut. Vegetative on less than 20% of eventing erosion. bughing present.	
	sediment depositio 10% of t			reach. Transient is 10-40% of the bottom.	channels have veg	getative protection on iks and depositional ontribute to stability.	vegetative protecti 40% of the bar sediment depos	on is present on > iks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread	Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.	
Score	3	3	2	.4		2	1.	6	1		2
NOTES>> 2. RIPARIA	N BUFFERS: A	Assess both bank			e entire SAR. (rou	18-A-STR-0		may be accepta			
	Opti  Tree stratum (dbh > with > 60% tree ca	a 3 inches) present, anopy cover and a derstory. Wetlands	Con Subop High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the	e entire SAR. (rou				NOTES>> Wetland ale streams lef	_	
2. RIPARIAI Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree on- non-maintained unc	a 3 inches) present, anopy cover and a derstory. Wetlands	Con Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Iginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	of length & width  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	NOTES>> Wetland ale streams lef	_	
2. RIPARIAI	Opti  Tree stratum (dbh > with > 60% tree on- non-maintained unc	mal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subol High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ugh measurements  Ginal  Low Marginal: Non- maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	of length & width  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Wetland ale streams lef	_	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	mal  3 inches) present, anopy cover and a lerstory. Wetlands e riparian areas.  5 each stream baniach by measurin	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  into Condition C	an areas along the ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and congth and congth and congth and width. Congth and congth and width. Congth and congth a	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Marginal: Non- maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dibh -3 inches) present, with <30% tree canpyo- cover with maintained understory.  Low  0.75	of length & width  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded, surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Wetland ale streams lef	_	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	mal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban ach by measurin Score for each ri	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  into Condition C	an areas along the ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and congth and congth and congth and width. Congth and congth and width. Congth and congth a	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Marginal: Non- maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dibh -3 inches) present, with <30% tree canpyo- cover with maintained understory.  Low  0.75	of length & width  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Wetland ale streams lef	ft bank.	
Condition Scores  1. Delineate rip descriptors. 2. Determine scores  Right Bank	Tree stratum (dbh > with > 60% free canon-maintained unclocated within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bandach by measurin Score for each rit 100%	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  into Condition C	an areas along the ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and congth and congth and congth and width. Congth and congth and width. Congth and congth a	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Marginal: Non- maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dibh -3 inches) present, with <30% tree canpyo- cover with maintained understory.  Low  0.75	of length & width  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> Wetland ale streams lef	ft bank.	o
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban ach by measurin Score for each ri 100%  1.1	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition C g or estimating lee parian category in	an areas along the ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and congth and congth and congth and width. Congth and congth and width. Congth and congth a	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	Low Marginal: Non- maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dibh -3 inches) present, with <30% tree canpyo- cover with maintained understory.  Low  0.75	of length & width  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  The sums iparian qual 100 100%	NOTES>> Wetland ald streams lef	ft bank.	<u>(</u>
Condition Scores  Delineate rip descriptors. Deltreate rip descriptors. Ended to the condition Right Bank  Left Bank  INSTREA	Tree stratum (dbh with > 60% tree canon-maintained unc located within the located within	imal  3 inches) present, anopy cover and a lerstory. Wetlands e riparian areas.  5  each stream ban ach by measurin  Score for each ri  100%  1.1  80%  1.5  aried substrate si	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition C g or estimating let parian category in  20%  1.1  zes, water velocit	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co ngth and width. (	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85 Indition Scores us Calculators are prov.	ugh measurements  ginal  Low Marginal: Non- maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	of length & width  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Les sums iparian qual 100 100%	NOTES>> Wetland ale streams lef	ores*0.01)/2	
Condition Scores  Delineate rip descriptors. Deltreate rip descriptors. Ended to the condition Right Bank  Left Bank  INSTREA	Tree stratum (dbh with > 60% tree canon-maintained und located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban ach by measurin Score for each ri 100% 1.1 80% 1.5 aried substrate siffle poole comple	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition C g or estimating let parian category ir  20% 1.1  zes, water velocit ixes, stable featur  Subop  Stable habitat eler	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. (and the blocks below the blocks	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85 Indition Scores us Calculators are provided to the pro	Low Marginal: Non- maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dibh -3 inches) present, with «30% tree canopy cover with maintained understory.  Low  0.75  ing the ovided for you	of length & width  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e  e; low embededn	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Les sums iparian qual 100 100%  100%	NOTES>> Wetland all streams lef	ores*0.01)/2	
Condition Scores  Delineate rip descriptors. Delineate rip descriptors. Delineate rip descriptors. Delineate rip descriptors. In Delineate rip descriptors. In Delineate rip descriptors. In Delineate rip descriptors. In Stream Habitat/	Tree stratum (dbh> with > 60% tree ca non-maintained unc located within the  1. carian areas along of quare footage for e Riparian Area and % Riparian Area> Score >  M Riparian Area> Score >  M HABITAT: Va ; root mats; SAV; ri	s a inches) present, anopy cover and a lerstory. Wetlands e riparian areas.  5 each stream bani ach by measurin 100% 1.1 80% 1.5 arried substrate si fifte poole comples mal	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating ler parian category ir  20% 1.1  zes, water velocit exes, stable featur  Subop  Stable habitat eler present in 30-50% are adequate for areas	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85 Indition Scores us Calculators are provided to the control of t	Low Marginal: Non- maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh -3 inches) present, with -30% tree canopy cover with maintained understory.  Low 0.75 sing the ovided for you	of length & width  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row corps, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  ne sums iparian qual 100  100%  100%	NOTES>> Wetland ale streams lef  CI= (Sum % RA*S Rt Bank CI > Lt Bank CI > NOTES>>	ores*0.01)/2	

	St	ream In	npact A	ssessn	nent For	m Page	2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB3	02080205	3/22/2016	06STR-A11		
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, mbankments, spoil piles, constrictions, livestock									
	Negligible	Mir	nor	al Category Mod	derate	Sev	rere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed	y of the channel in the parameter OR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0

### INSERT PHOTOS:



Top Lefy: Culvert 18 Top Right: Typical view of stream Bottom Left: Typical view of stream Bottom Right: Typical view of stream

NC DWQ Stream Identification Form Version 4.11 Grindall Creek 06-STR-A-11

THE BYTY Stream Identification Form Ver	51011 1111	
Date: 3/22/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.467167
Evaluator: L. Eggering, K. Astroth	County: Richmond (city)	Longitude: -77.454439
<b>Total Points:</b> 46.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitted Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*	Epitemeral inter	illittent Pereilli	e.g. Quad Name.	
A. Geomorphology (Subtotal = 20.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
Sinuosity of channel along thalweg	0	1	2	(3)
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	(3)
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 11 )				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5		1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	= 0	Yes:	= 3
C. Biology (Subtotal = 14.75)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	(3)

18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	(3)
21. Aquatic Mollusks	0	1	(2)	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.73;	OBL = 1.5 Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Grindall Creek. Good flow. Varied substrate sizes. Riffles and pools. Culvert is under sized for stream flow.

Field Sheet: 18-A-STR-09.

Sketch:

				perennial	intermittent or p	nels classified as	n wadeable chan	For use in			
	Impact Factor	Impact/SAR length	SAR#	Date	HUC	Cowardin Class.	Locality		Project Name		Project #
				09/12/2016	02080206	R2SB4	VA	06	C2RVA - Area	DC	N/A
				D A 12	06-STF	tion	e and Informa	Stream Name		e(s) of Evaluat	
				X-A-12		dition (oracion, agr	and provailing con-	on of the stream a		taski, R. Ma condition: Asses	
	ere	Sev	or	Po		Conditional Categor				Opti	Chamile C
	ere die	A	<del>,</del>		giriai	Mary	ptimai	- Subo	illiai	У	
		Deeply incised (		Overwiden		Often incised, but I	ew areas of active	Slightly incised, fr	WA .	my white	
	tained within the d below average ajority of banks spetative protection n 20% of banks, is on. Obvious bank Erosion/raw banks b/OR Aggrading nan 80% of stream by deposition, stability. Multiple	rooting depth, m: vertical/undercut. Ve present on less thar not preventing erosi sloughing present. on 80-100%. AND channel. Greater th bed is covered contributing to ins	jority of both banks rosion present on 60- getative protection  % of banks, and is  not erasion. AND/OR  eam is covered by  Sediment is  ent in nature, and  ability. AND/OR V- s have vegetative  ent on > 40% of the	are near vertical. En 80% of banks. Ver present on 20-409 insufficient to prever 60-80% of the stre sediment. S temporary/transic contributing to insta- shaped channels protection is presen	esent on 40-60% of ive protection on 40-treambanks may rcut. AND/OR 40-wered by sediment. emporary/transient, ty. Deposition that ability, may be ND/OR V-shaped stative protection on	or Poor due to lo Erosion may be pre both banks. Vegetat 60% of banks. S bevertical or unde 60% of stream is co Sediment may be t contribute instabili contribute to st forming/present. A	ted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR rures contribute to nkfull and low flow effined. Stream likely nkfull benches, or floodplains along reach. Transient -3-40% of the stream	erosion or unprotect of banks are st Vegetative protect prominent (60-Depositional feat stability. The bar channels are well de has access to ban newly developed portions of the r	iches are present. iginal floodplain or le bankfull benches. and transverse bars diment deposition	100% stable banks.	Channel Condition
CI	w.	thread channels an		abse	tribute to stability.	features which cor			_		
2.4		1	.b	1.	2	Field Sheet:	.4	2	3	3	Score NOTES>>
		NOTES>>A se is located nea bank.		length & width ma	measurements of	gory	areas along the enditional Cate ptimal	Con		Opti	. RIPARIAN
		bain.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	anopy cover and a derstory. Wetlands	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	Riparian Buffers
			1	High	Low	High	Low	High	_		Condition
			Low			0.85	1.1	1.2	.5	1.	Scores
			0.5	0.6	0.75	0.03					Delineate ripa
				Ensure the	the descriptors.	ition Scores using	th and width. Cal	0 0	ach by measuring	rian areas along eauare footage for ea	·
			0.5 the sums	Ensure the	the descriptors.	ition Scores using	th and width. Cal	or estimating leng	ach by measuring Score for each ripa 80%	uare footage for ea iparian Area and S % Riparian Area>	·
	ores*0.01)/2	CI= (Sum % RA * Sc	0.5 the sums Riparian	Ensure the	the descriptors.	ition Scores using	th and width. Cal	or estimating leng	ach by measuring	uare footage for ea iparian Area and S % Riparian Area> Score >	Enter the % R
CI 0.98	0.98	Rt Bank CI >	0.5 the sums Riparian	Ensure the	the descriptors.	ition Scores using	th and width. Cal	or estimating leng	Score for each ripa 80% 1.1	uare footage for ea iparian Area and S % Riparian Area>	Enter the % R
CI 0.98		Rt Bank CI >	0.5 the sums Riparian equal 100 100%	Ensure the of % R Blocks en	the descriptors.	ition Scores using culators are provid	th and width. Calc	arian category in the 20% 0.5 50% 0.75	80% 1.1 50%	iparian Area and S  % Riparian Area> Score >  % Riparian Area> Score >	Enter the % R Right Bank Left Bank
	0.98	Rt Bank CI >	0.5 the sums Riparian equal 100 100%	Ensure the of % R Blocks en	the descriptors.	ition Scores using sulators are provided	th and width. Calc ne blocks below.	arian category in the 20% 0.5 50% 0.75 es, water velocity a	80% 1.1 50% 1.2 rried substrate size	iparian Area and S  % Riparian Area> Score >	Enter the % R Right Bank  Left Bank  INSTREAN
	0.98	Rt Bank CI >	0.5 the sums Riparian equal 100 100% 100%	Ensure the of % R Blocks en	the descriptors.	tion Scores using sulators are provided are	th and width. Calc ne blocks below.	or estimating leng arian category in the 20% 0.5 50% 0.75 es, water velocity a features.	80% 1.1 50% 1.2 rried substrate size	ware footage for earliparian Area and S  % Riparian Area Score >  % Riparian Area Score >  1 HABITAT: Var.; SAV; riffle poole of	Enter the % R Right Bank  Left Bank  . INSTREAM anks; root mats.
	0.98	Rt Bank CI >	0.5 the sums Riparian equal 100 100% 100% s; shade; undercut	Ensure ti of % R Blocks er  Blocks er  which is a second of the second o	the descriptors. ed for you below.  stable substrate; le  ginal ments are typically of the reach and are anintenance of	r and leafy debris;  al Category  Mary  Stable habitat eler	th and width. Calc ne blocks below.  and depths; woody	or estimating leng arian category in the 20% 0.5 50% 0.75 es, water velocity a features. Subor	Score for each ripa  80% 1.1  50% 1.2  Irried substrate size complexes, stable imal	ware footage for earliparian Area and S  % Riparian Area Score >  % Riparian Area Score >  1 HABITAT: Var.; SAV; riffle poole of	Enter the % R Right Bank Left Bank . INSTREAN

	St	tream In	npact A	ssessm	ent For	m Page	2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB4	02080206	09/12/2016	06STR-A12	500	1
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock  Conditional Category									
	Negligible Mi		nor	Mode	erate	Severe			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	by any of the change in the parameter g 80% of banks sh	of reach is disrupted nel alterations listed juidelines AND/OR ored with gabion, r cement.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH (	CONDITION I	NDEX and S	TREAM CON	NDITION UNI	TS FOR THIS	SREACH		
NOTE: The Cls and R	CI should be rounded to 2 decimal places. Th	ne CR should be rounde	ed to a whole number.				THE REACH	CONDITION IN	IDEX (RCI) >>

RCI= (Sum of all Cl's)/5
COMPENSATION REQUIREMENT (CR) >>

0 CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: Stream channel. Top Right: Stream channel.



NC DWQ Stream Identification Form Version 4.11

06-STR-A-12

Date: 09/12/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.461244
Evaluator: L. Postaski, R. Magnum	County: Chesterfield	Longitude: -77.450416
<b>Total Points:</b> 19 Stream is at least intermittent if ≥ 19 or perennial if ≥ $30^*$	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 8 )	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $3.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	0_	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
C. Biology (Subtotal = 7.5)		_		
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75,	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other met	•			
Notes: This stream runs parallel to the railway,	continuing under Wa	ılmsley Blvd.		
	_			
Sketch:	$\times$			
		$\searrow$		

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin Impact/SAR **Impact** Project # **Project Name** Locality HUC Date SAR# Class length Factor N/A DC2RVA - Area 06 ۷A R6 02080206 09/12/2016 1 Name(s) of Evaluator(s) **Stream Name and Information** 06-STR-A-13 L. Postaski, R. Mangum 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>>Walmsely Blvd. parralels the right Optimal Suboptimal Marginal Poor stream bank; a Low Marginal: High Poor: ow Suboptimal powerline ROW parralels Lawns, mowed, and maintained High Suboptima Riparian areas High Marginal Riparian areas Low Poor: the left stream bank. with tree stratum Non-maintained vegetation. with tree stratum areas, nurseries Impervious (dbh > 3 inches) nse herhaceou riparian areas (dbh > 3 inches) no-till cropland; acking shrub and present, with vegetation with Free stratum (dbh > 3 inches) present resent, with 30% actively grazed spoil lands, Riparian 30% tree canor either a shrub tree stratum hav with > 60% tree canopy cover and ar non-maintained understory. Wetland to 60% tree pasture, sparsely vegetated nonenuded surfaces layer or a tree cover and a roduction, pond **Buffers** anopy cover and row crops, active maintained laver (dbh > 3 open water. If areas. containing both maintained area feed lots, trails, or understory. present, tree herbaceous and recently seeded other comparable Recent cutover with <30% tree stratum (dbh >3 shrub lavers or a and stabilized, or conditions. inches) present with <30% tree (dense canopy cover. non-maintained understory. vegetation). condition. canopy cover with maintained understory High Low High Low High Low Condition 1.5 0.85 0.6 0.5 1.2 1.1 0.75 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 100% 100% Right Bank Score > 0.6 Rt Bank CI > 100% 100% 0.60 CI % Riparian Area> Left Bank 0.85 Lt Bank CI > 0.85 0.73 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.37 NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number. RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF INSERT PHOTOS:



Shallow ephemeral channel

NC DWQ Stream Identification Form Version 4.11

## 06-STR-A-13

Date: 09/12/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.460742
Evaluator: L. Postaski, R. Magnum	County: Chesterfield	Longitude: -77.450903
Total Points: 11 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 2)	Absent	Weak	Moderate	Strong
1 <sup>a</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain		1	2	3
6. Depositional bars or benches		1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	= 0	Yes	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $\underline{2.5}$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes	= 3
C. Biology (Subtotal = 6.5				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75,	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other meth	ods. See p. 35 of manua			
Notes:				
Sketch:				
	• : =			
	W	almsley Blvd.		

Powerline ROW

Stream channel

		Stre				Form for use in Virg	(For	m 1)			
				wadeable chan	nels classified a	s intermittent or	perennial		Impact/SAR	Impact	
Project #	ı	Project Name	•	Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A		C2RVA - Area		VA	R2SB3	02080206	3/23/2016				
	e(s) of Evalua gering & K. A	. ,	Stream Nam	e and Informa	ation	06 671	R-A-14				
	Condition: Asse		4i				N-A-14				
Channel				C	Conditional Catego	ry					
	Opti	ımal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	"	L MA	Slightly incised for	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		Describing		
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully	n or natural rock, 100%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	cted banks. Majority able (60-80%). ion or natural rock 80%) AND/OR ures contribute to ikfull and low flow I defined. Stream b bankfull benches, d floodplains along	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Maju are near vertical. E 60-80% of banl protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the bed by sediment. orary/transient in outing to instability.	Deeply incised vertical/lateral in: incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sic Erosion/raw ban	stability. Severe tained within the ed below average hajority of banks ut. Vegetative on less than 20% of eventing erosion. Dughing present. ks on 80-100%.	
		on covers less than	sediment cover	each. Transient s 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the barn sediment depos	on is present on > iks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	CI
Score	3	3	2	.4	:	2	1.	6	1		2.4
NOTES>>				Fi	ield Sheet:	18-A-STR-	10.				
. RIPARIAN	N BUFFERS: A	Assess both bank	d's 100 foot riparia	n areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt	h may be accep	table)		
				ditional Cate					NOTES>>		
	Opti	<u>imal</u>	High Suboptimal: Riparian areas with tree stratum	Low Suboptimal: Riparian areas with tree stratum	High Marginal:	Low Marginal: Non-maintained,	Po High Poor:	or			
Riparian Buffers		anopy cover and a derstory. Wetlands	(dbh > 3 inches) present, with 30% to 60% tree	(dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with < 30% tree canopy cover.	dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a href="https://doi.org/10.10/4/bit/30%">https://doi.org/10.10/4/bit/30%</a> tree canopy cover with maintained	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
	with > 60% tree ca	anopy cover and a derstory. Wetlands	(dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	(dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, recently seeded and stabilized, or other comparable	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Buffers	with > 60% tree ca non-maintained und located within the	anopy cover and a derstory. Wetlands	(dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	(dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Condition Scores  Delineate ripsescriptors. Determine scolelow.	with > 60% tree ca non-maintained und located within the	anopy cover and a derstory. Wetlands er iparian areas.  5 each stream ban each by measuring	(dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	(dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  ategories and Co	dense herbaceous vegetation with either a shrub layer or a tree layer (dhh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are presents  Calculators are presents  Calculators are presents  Output  Dendition Scores us Calculators are presents  Calculators are presents  Output  Dendition Scores us  Calculators are presents  Calculators are presents  Calculators are presents  Output  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Dendition Scores us  Calculators are presents  Dendition Scores us  Dendition Scor	vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
Condition Scores  Delineate rips scriptors. Determine scolow. Enter the % F	with > 60% free connection and the connection and the connection are as along a quare footage for e	anopy cover and a derstory. Wetlands er iparian areas.  5 each stream ban each by measuring	(dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	(dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  ategories and Co	dense herbaceous vegetation with either a shrub layer or a tree layer (dhh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are presents  Calculators are presents  Calculators are presents  Output  Dendition Scores us Calculators are presents  Calculators are presents  Output  Dendition Scores us  Calculators are presents  Calculators are presents  Calculators are presents  Output  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Calculators are presents  Dendition Scores us  Dendition Scores us  Calculators are presents  Dendition Scores us  Dendition Scor	vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
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#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point Project # Date SAR length Impact Factor R2SB3 02080206 3/23/2016 06STR-A14 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. is disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not cement. guidelines. guidelines. recovered. recovered. CI SCORE 1.5 1.3 1.1 0.9 0.7 0.5 1.30

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0 CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: Typical view upstream Bottom Right: Typical view of stream, debris pile in headcut

NC DWQ Stream Identification Form Version 4.11

## 06-STR-A-14

Date: 3/22/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.451584
Evaluator: L. Eggering, K. Astroth	County: Chesterfield	Longitude: -77.451954
<b>Total Points:</b> 22.25 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 9)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	(1)	2	3
Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel		0 = 0	Yes:	
<sup>a</sup> artificial ditches are not rated; see discussions in manual			100	
B. Hydrology (Subtotal = 5)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?		o = 0	Yes :	= 3
C. Biology (Subtotal = $8.25$ )			_	
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.73;	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other methods	s. See p. 35 of manua	_		
Notes: Stream runs parallel to railroad. WTL-11 is	within riparian zo	ne downstream	of data point. Field	Sheet:
18-A-STR-10.	-		-	
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Sketch:	Carried State of the State of t	Contract of the Contract of th		
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		5 N			nels classified a	s intermittent or		242 "	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R2SB	02080206	3/23/2016				
	e(s) of Evaluat gering & K. A	. ,	Stream Nam	e and Informa		ΓR-Δ-15	(Falling	Crook)			
	Condition: Asse		tion of the stream	and prevailing of			(Failing	Creek)			
. Onamici c				C	onditional Catego	ry	D-		0		
	Opti	mai	Subo	ptimal	Iviar	ginal	Po	or	Sev	ere	
		صوبه هملا	Slightly incised, fr	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally u		Deeply incised	(or excapated)	
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-11 Stable point bars), are present. Acce floodplain or fully bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches as to their original of developed wide Mid-channel bars,	erosion or unproted of banks are stogetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock 80%) AND/OR ures contribute to ktfull and low flow II defined. Stream bankfull benches, d floodplains along	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	wer bank slopes. esent on 40-60% of tative protection on Streambanks may crcut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Majo are near vertical. E 60-80% of banh protection preser banks, and is insul erosion. AND/OF stream is covere Sediment is tempo nature, and contrib AND/OR V-shape	rosion present on as. Vegetative at on 20-40% of fficient to prevent a 60-80% of the d by sediment. orary/transient in uting to instability.	vertical/lateral insincision, flow conbanks. Streambe rooting depth, m vertical/undercrotection present obanks, is not pre Obvious bank sic Erosion/raw bank	stability. Severe tained within the d below average ajority of banks ut. Vegetative in less than 20% of venting erosion. bughing present. ks on 80-100%.	
	sediment depositio 10% of I	n covers less than	sediment cover	each. Transient s 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the onal features which to stability.	vegetative protectic 40% of the ban sediment depos	on is present on > ks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterrand	bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1		2.4
NOTES>>				Fi	eld Sheet:	18-A-STR-	11.				
. RIPARIAI	N BUFFERS: A	Assess both bank	c's 100 foot riparia	in areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt	h may be accep	table)		
			Con	ditional Cate	gory				NOTES>>		
	Opti	mal	Subo	ptimal	Mar	ginal Low Marginal:	Po	or			
			High Suboptimal: Riparian areas with tree stratum	Low Suboptimal: Riparian areas with tree stratum	High Marginal:	Non-maintained,	High Poor:				
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the	anopy cover and a derstory. Wetlands	(dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	(dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Buffers	with > 60% tree ca	anopy cover and a derstory. Wetlands e riparian areas.	(dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	(dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
	with > 60% tree ca	anopy cover and a derstory. Wetlands e riparian areas.	(dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	(dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Condition Scores  Delineate ripiescriptors.  Determine scorelow.	with > 60% tree ca	anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban ach by measurin	(dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	(dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  attegories and Co	dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are pr	vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Condition Scores  Delineate rip: escriptors. Determine so	with > 60% free ca non-maintained und located within the 1. arian areas along of quare footage for e Riparian Area and % Riparian Area>	anopy cover and a derstory. Wetlands er liparian areas.  5  beach stream ban ach by measurin Score for each r 25%	(dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 75%	(dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  attegories and Co	dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are pr	vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right and supplied the supplied	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % I	with > 60% free ca non-maintained und located within the	anopy cover and a derstory. Wetlands e riparian areas.  5  Beach stream ban ach by measurin Score for each r	(dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in	(dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  attegories and Co	dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are pr	vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right and supplied the supplied	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  Les sums  parian  qual 100	CI= (Sum % RA * Sc	pores*0.01)/2	
Condition Scores  Delineate rip: escriptors. Determine scelow. Enter the % I	with > 60% tree ca non-maintained unclocated within the located within the arian areas along of quare footage for e Riparian Area and % Riparian Area > Score >	score for each r 25% 0.5	(dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating let parian category in 75%  0.85	(dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  attegories and Co	dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are pr	vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right and supplied the supplied	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  Les sums  parian  qual 100	Rt Bank CI >	0.76	CI
Condition Scores  Delineate rip: escriptors. Determine scelow. Enter the % I	with > 60% tree ca non-maintained und located within the	score for each r 25% 0.5 75% 0.5	(dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 75% 0.85	(dbh s 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Co ngth and width. Co	dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us  Calculators are prov.	vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right and the seeded and stabilized, and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel foliation, and conditions.  Low 0.5  Le sums imparian qual 100 100%	Rt Bank CI >		CI 0.68
Condition Scores  Delineate rippescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  INSTREAL	with > 60% tree ca non-maintained unclocated within the located within the arian areas along of quare footage for e Riparian Area and % Riparian Area > Score >	5  beach stream ban ach by measurin 25% 0.5  75% 0.5  aried substrate si	(dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 75% 0.85  25% 0.85	(dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  ategories and Coungth and width. Coungth and width. Coungth and width. Coungth and width with the blocks below	dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Calculators are pr	vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right and the seeded and stabilized, and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel foliation, and conditions.  Low 0.5  Le sums imparian qual 100 100%	Rt Bank CI >	0.76	
Condition Scores  Delineate ripidescriptors. Descriptors. Ender the % I Right Bank  Left Bank  Left Bank  Instream	with > 60% tree ca non-maintained und located within the located within the arian areas along of quare footage for e Riparian Area > Score > M Riparian Area> Score >	5  seach stream ban ach by measurin Score for each r 25% 0.5  75% 0.5  aried substrate siffle poole comple	(dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 75% 0.85  25% 0.85	(dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  attegories and Coungth and width. Counth blocks below	dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a>200</a> where the canopy cover.  High  0.85  Indition Scores us calculators are proved.	vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right and the seeded and stabilized, and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or choter comparable conditions.  Low 0.5  Les sums parian qual 100  100%  100%	Rt Bank CI >	0.76	
Condition Scores  Delineate rip descriptors. Descriptors. Enter the % I Right Bank  Left Bank  Left Bank  Left Bank  Left Bank	with > 60% tree ca non-maintained unc located within the  1. arian areas along of quare footage for e Riparian Area and % Riparian Area > Score >  M HABITAT: Va root mats; SAV; ri	5  beach stream ban ach by measurin 25% 0.5  75% 0.5  aried substrate siffle poole completimal	(dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating let parian category it 75% 0.85  25% 0.85  izes, water velocit exes, stable featu  Subo  Stable habitat ele	(dbh s 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  attegories and Co ngth and width. Co the blocks below  y and depths; wo res.  Conditiona ptimal ments are typically	dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are prov.  Calculators are prov.  Il Category  Mar  Stable habitat ele	vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substrations stable substrations are typically ments are typically	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks ed.  Blocks ed.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums sparian surfaces and 100%  100%  100%	Rt Bank CI >	0.76	
Condition Scores  Delineate ripi descriptors. Descriptors	with > 60% tree ca non-maintained unc located within the  1. arian areas along of quare footage for e Riparian Area and % Riparian Area > Score >  M HABITAT: Va root mats; SAV; ri	anopy cover and a derstory. Wetlands or riparian areas.  5  Each stream ban each by measuring Score for each reach stream ban on the stream of	(dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le iparian category in 75% 0.85  25% 0.85  izes, water velocit exes, stable featu Subo Stable habitat ele present in 30-50% are adequate fo	(dbh s 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  ategories and Co ngth and width. Co n the blocks below  y and depths; wo res. Conditiona	dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are prov.  It Category  Mar  Stable habitat ele present in 10-30 are adequate for	vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the povided for you  pris; stable substr	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks economia and stabilized, or other comparable condition.	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel foliation, and conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%	Rt Bank CI >	0.76	

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB	02080206	3/23/2016	06STR-A15		
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock  Conditional Category  Negligible  Minor  Moderate  Severe									
	Negligible	Mi	nor	Mod	erate	Sev	ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed	y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5		

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



Typical view of stream

NC DWQ Stream Identification Form Version 4.11 Falling Creek 06-STR-A-15

1,02,162,0000000000000000000000000000000		
Date: 3/22/2016	Project/Site: DC2RVA - Area 06	<b>Latitude:</b> 37.448189
Evaluator: L. Eggering, K. Astroth	County: Chesterfield	Longitude: -77.452569
<b>Total Points:</b> 38.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitted Perennia	Other e.g. Quad Name:

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 1 1 1 1 1 0.5 0.5 0.5 0 = 0	2 2 2 2 2 2 2 2 1 1 Yes =	3 3 3 3 3 3 3 1.5 1.5 1.5 3 0 1.5
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 1 1 1 1 0.5 0.5 0.5 0 = 0	2 2 2 2 2 1 1 Yes =	3 3 3 3 3 3 1.5 1.5 = 3
0 0 0 0 0 0 0 0 0 0 0	1 1 1 1 0.5 0.5 0.5 0 = 0	2 2 2 2 2 1 1 Yes =	3 3 3 3 1.5 1.5 1.5
0 0 0 0 0 0 0 0 0 0 0	1 1 1 1 0.5 0.5 0.5 0 = 0	2 2 2 2 2 1 1 Yes =	3 3 3 3 1.5 1.5 1.5
0 0 0 0 0 0 0 No	1 1 0.5 0.5 0.5 0 = 0	2 2 2 1 1 Yes =	3 3 3 1.5 1.5 1.5 3 0
0 0 0 0 0 0 0 0 0	1 1 0.5 0.5 0.5 0 = 0	2 2 1 1 Yes =	3 3 1.5 1.5 = 3
0 0 0 0 0 No	1 0.5 0.5 0.5 0 = 0	2 1 1 Yes =	3 3 1.5 1.5 = 3 3 0
0 0 0 No	1 0.5 0.5 0.5 0 = 0	2 Yes =	3 1.5 1.5 = 3 3 0
0 0 No	0.5 0.5 0 = 0 1 1 1 0.5	Yes = 2 0.5	1.5 1.5 = 3 3 0
0 No	0.5 0 = 0 1 1 1 0.5	2 2 0.5	1.5 3 3 0
0 0 0 1.5	1 1 1 0.5	2 2 0.5	3 3 0
0 0 1.5 0	1 1 1 0.5	2 2 0.5	3 3 0
0 1.5 0	1 1 0.5	0.5	3 0
0 1.5 0	1 1 0.5	0.5	3 0
0 1.5 0	1 1 0.5	0.5	3 0
0	1 0.5	0.5	0
0	0.5		
·		1	1.5
0	0.5		
	-0.5	1	1.5
No	0 = 0	Yes =	= 3
3	(2)	1	0
3	2	1	0
0	1	(2)	3
0	1	(2)	3
0	0.5	1	1.5
0	0.5	(1)	1.5
0	0.5	(1)	1.5
0	0.5	1	1.5
	FACW = 0.75; (	OBL = 1.5 Other = 0	
35 of manua	l.		
Field Shee	et: 18-A-STR-11.		
possibly	man made)		
	0 0 0 0 0 0 0 0	3 2 0 1 0 1 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5 0 0.5	3 2 1 0 1 2 0 0 1 2 0 0 0.5 1 0 0 0.5 1 0 0 0.5 1 0 0 0.5 1 0 0 0.5 1 0 0 0.5 0 1 0 FACW = 0.75; OBL = 1.5 Other = 0

Cogbill Road

		Stre				Form	) (For	m 1)			
					nels classified a	s intermittent or	perennial		Impact/SAR	Impact	
Project #	l	Project Name	•	Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R2SB3	02080206	3/23/2016				
	e(s) of Evalua jering & K. A	` '	Stream Nam	e and Informa	ation	06 87	R-A-16				
	condition: Asse		tion of the other re-				K-A-10				
Channel				C	Conditional Catego	ry					
	Opti	mai	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
		مسريد المملا	Slightly incised, fu	ew areas of active		less than Severe or stable than Severe	Overwiden: Vertically/laterally		Deeply incised	(or executated)	
Channel Condition	Very little incision of 100% stable bar surface protection prominent (80-1) Stable point bars/are present. Acce floodplain or fully bankfull benches. and transverse be	n or natural rock, 00%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock .80%) AND/OR ures contribute to whifull and low flow ll defined. Stream to bankfull benches, d floodplains along	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by discovered by discovered by discovered by discovered to that contribute on that contribute to the significant of th	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/OI stream is covere Sediment is temp nature, and contrit AND/OR V-shape	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. orary/transient in buting to instability.	vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank skl. Erosion/raw ban	stability. Severe tained within the do below average tajority of banks ut. Vegetative on less than 20% of venting erosion. Dughing present. ks on 80-100%.	
	sediment deposition 10% of 1	n covers less than	sediment cover	each. Transient s 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar	on is present on > nks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by outing to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1	1	2.4
NOTES>>				Fi	ield Sheet:	18-A-STR-	12.				
. RIPARIAN	N BUFFERS: A	Assess both bank	s's 100 foot riparia	in areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	th may be accep	table)		
				ditional Cate					NOTES>>		
Riparian Buffers	Tree stratum (dbh > with > 60% tree conon-maintained und located within the	· 3 inches) present, inopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or of other comparable conditions.			
				_		maintained understory.		_			
Condition	1.	E	High 1.2	Low	High 0.85	0.75	High	Low	-		
escriptors.  Determine solow.	I arian areas along o uare footage for e	each stream ban	k into Condition C	ngth and width. (	I ondition Scores us Calculators are pr	sing the		iparian			
	Riparian Area and % Riparian Area>	80%	parian category ii 20%	THE DIOCKS DEION	v.		Blocks e	100%	•		
Right Bank	Score >	0.85	0.5								
	% Riparian Area>	60%	30%	10%				100%	CI= (Sum % RA * S Rt Bank CI >	cores*0.01)/2 0.78	CI
Left Bank	Score >	1.1	0.85	0.5					Lt Bank CI >	0.97	0.87
	M HABITAT: Va				ody and leafy deb	oris; stable substr	ate; low embeded	lness; shade;	NOTES>>		_
	root mats; SAV; ri	ffle poole comple	exes, stable featu	res. Conditiona	al Category				Varied sub		
Instream Habitat/	Opti	mal		ptimal	Mar	ginal	Po		sized, shad	led, riffles.	
Available Cover	Habitat elements a in greater than 5	re typically present	present in 30-50%	ments are typically 6 of the reach and r maintenance of	present in 10-309	ments are typically % of the reach and or maintenance of	Habitat elements lacking or are ur elements are typic	stable. Habitat			
Score	1.		popul	ations.	popul	ations.	than 10% o	f the reach.			1.50
			. 1								

	St	ream In	npact A	ssessm	ent For	rm Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX VA R2SB3 02080206 3/23/2016 06STR-A1					06STR-A16			
	CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, bankments, spoil piles, constrictions, livestock							NOTES>>	
	No. Part I		Conditiona						
	Negligible	IVIII	nor	Mod	erate	Sev	rere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed	y of the channel in the parameter OR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH C	ONDITION IN	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH		
VOTE: The Cle and P	2Cl should be rounded to 2 decimal places	The CB chould be seen	dad to a whole numbe				THE DEACH	CONDITION INI	DEV (DCI)

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: Culvert 21 Top Right: Culvert 24 Bottom Left: Typical view near CUL-24 Bottom Right: Typical view north of VA150

**NC DWQ Stream Identification Form Version 4.11** 

## 06-STR-A-16

Date: 3/23/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.445146
Evaluator: L. Eggering, K. Astroth	County: Chesterfield	Longitude: -77.453159
<b>Total Points:</b> 38 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitted Perennial	Other e.g. Quad Name:

Absent	Weak	Moderate	Strong
0	1	2	3
0	1	(2)	3
0	1	2	3
0	1	2	3
0	(1)	2	3
0	1	2	3
0	1	2	3
0	1	2	3
0	0.5	1	1.5
0	0.5	(1) _	1.5
No	= 0	Yes	= 3
	0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	0     1       0     1       0     1       0     1       0     1       0     1       0     1       0     1       0     1       0     1       0     1       0     1       0     0       0

### B. Hydrology (Subtotal = $\frac{7.5}{}$ )

12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes:	= 3

C. Biology (Subtotal = 12

18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other = 0	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream flows under railroad via Cul-4. Where water enters culvert elevation drops 2 ft.. Field Sheet:

18-A-STR-12.

Sketch:



		Stre		fied Stream N	lethodology f	or use in Virg	ginia	· · · · · · · · · · · · · · · · · · ·			
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	06	VA	R2SB	02080206	3/24/2016				
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation	l	1				
L. Egg	gering & K. A	Astroth				06-STI	R-A-17				
I. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal	onditional Catego Mar	g <mark>inal</mark>	Po	or	Sev	ere	
	1	W AND	1		Often incised, but	less than Severe or	Overwiden	ed/incised.	1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point barsa are present. Acce floodplain or fully	n or natural rock, 100%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are stogetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to rewly develope	tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow Il defined. Stream o bankfull benches, d floodplains along	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	esent on 40-60% of tative protection on Streambanks may crcut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu- erosion. AND/OI stream is coverr Sediment is temp nature, and contril	ority of both banks crosion present on ks. Vegetative int on 20-40% of efficient to prevent R 60-80% of the ed by sediment. corary/transient in couting to instability.	incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sl Erosion/raw ban	stability. Severe tatained within the ed below average hajority of banks ut. Vegetative on less than 20% of vventing erosion. Dughing present. ks on 80-100%.	
	sediment deposition 10% of	on covers less than	sediment cover	reach. Transient rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have on on > 40% of the onal features which to stability.	AND/OR V-shape vegetative protecti 40% of the bar sediment depor	on is present on > nks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	С
Score	3	3	2	4	:	2	1.	6	1	l	1.6
NOTES>> 2. RIPARIAN	N BUFFERS: /	Assess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & wid	th may be accep		ata Sheet.	
	Opti Tree stratum (dbh: with > 60% tree ca	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the	e entire SAR. (roo		Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	th may be accep	table)	ata Sneet.	
2. RIPARIAN	Opti Tree stratum (dbh : with > 60% tree cr. non-maintained un	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a	an areas along the ditional Categorimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas latree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	table)	ata Sneet.	
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2. RIPARIAN	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorium Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	table)	ata Sneet.	
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Condition Scores  Delineate rips Condition Scores  Delineate rips Condition Scores  Delternine scoelow Condition Scores  Left Bank  Left Bank  Instream Habitat/	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  W HABITAT: Vi root mats; SAV; r	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  5  each stream ban each by measurin 5% 0.6  10% 1.1  aried substrate si iffle poole completimal	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 95% 0.5  90% 0.6  zes, water velocit exes, stable featu  Subo  Stable habitat ele	an areas along the ditional Categories and Council Categories and Categories and Council Categories and Council Categories and Council Categories and Council Categories and Council Categories and Council Categories and Council Categories and Council Categories and Council Categories and Council Categories and Council Categories and Council Categories and Council Categories and Council Categories and Council Categories and Council Categories and Council Categories and Council Categories and Council Categories and Categories and Council Categories and Categories and Council Categories and Cat	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI >	cores*0.01)/2 0.51	
Condition Scores  1. Delineate ript descriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank 3. INSTREAI undercut banks; Instream	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  W HABITAT: Vi root mats; SAV; r	Assess both bank  imal  > 3 inches) present, anopy cover and a derstory. Wetlands ie riparian areas.  .5  each stream ban each by measurin 5% 0.6  10% 1.1  aried substrate si iffle poole completimal are typically present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 95% 0.5  90% 0.6  zes, water velocit exes, stable featu Subo Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Categorismal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and width. Congth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	CI= (Sum % RA * Si Rt Bank CI > Lt Bank CI >	cores*0.01)/2 0.51	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point Project # Date SAR length Impact Factor R2SB 02080206 3/24/2016 06STR-A17 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by any of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. is disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has been guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not cement. guidelines. guidelines. recovered. recovered. CI SCORE 1.5 1.3 1.1 0.9 0.7 0.5 0.70 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

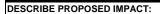
0

CR = RCI X LF X IF

### INSERT PHOTOS:



Right Top: View of stream at DP-2 Right Bottom: View southwest near DP-2



NC DWQ Stream Identification Form Version 4.11

## 06-STR-A-17

Date: 3/24/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.436780
Evaluator: L. Eggering, K. Astroth	County: Chesterfield	Longitude: -77.453561
<b>Total Points:</b> 34.5 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermitted Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 15.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	(3)
ripple-pool sequence	U	· · · · · · · · · · · · · · · · · · ·		
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0		2	3
7. Recent alluvial deposits	0		2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 8				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5		1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
C. Biology (Subtotal = 11 )			•	
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	Y	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	(1.5)
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other metho	ds. See p. 35 of manua	ıl.		
Notes: Field Sheet: 2nd data pt on Stream 12.				
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Sketch: CSX ROW				
CON ROW	The section of the contract of		er and a second property of	and the same of th
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		Stre	Uni	fied Stream M	lethodology f	or use in Virg		m 1 <i>)</i>			
Project #		Project Name		Locality	nels classified a Cowardin Class.	HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	06	VA	R4SB	02080206	3/24/2016				
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation	ı					
L. Egg	gering & K. A	Astroth				06-ST	R-A-18				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal	onditional Catego Mar	ry ginal	Po	or	Sev	ere	
	1	W.	1		Often incised, but I	less than Severe or	Overwiden	ed/incised.	1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	inks. Vegetative in or natural rock, 100%). AND/OR /bankfull benches less to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are stogetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to rewly develope	ew areas of active cted banks. Majority table (60-80%). titon or natural rock-80%) AND/OR tures contribute to nkfull and low flow flow obankfull benches, defloodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe wer bank slopes. seent on 40-60% of tative protection on Streambanks may errut. AND/OR 40- n is covered by diment may be sisent, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious bank sl Erosion/raw ban	stability. Severe tained within the ed below average hajority of banks ut. Vegetative on less than 20% of venting erosion. Dughing present. ks on 80-100%.	
	sediment deposition 10% of	on covers less than bottom.		rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depos	ks and stable	AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.		C
Score	- 3	3	2	2.4		2	1.	6	1		1.6
2. RIPARIAI	N BUFFERS: /	Assess both bank						am 13 Inte	table)	7.011.101	
2. RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present,	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or	or		and Road	
Riparian	Opti Tree stratum (dbh : with > 60% tree cr. non-maintained un	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> CSX ROW Dalebrook	and Road	
Riparian Buffers	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">30% tree canopy cover.</a> High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> CSX ROW Dalebrook	and Road	
Riparian	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> CSX ROW Dalebrook	and Road	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree conon-maintained un located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating leparian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widd  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> CSX ROW Dalebrook	and Road	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 10%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widd  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> CSX ROW Dalebrook	and Road	
Riparian Buffers  Condition Scores  Delineate rip lescriptors. Delves. Enter the %	Tree stratum (dbh: with > 60% tree conon-maintained un located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating leparian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widd  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> CSX ROW Dalebrook	and Road Im scores.	
Riparian Buffers  Condition Scores  Delineate rip descriptors. Legion of the condition of t	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  80%  1.2	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.6	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widd  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> CSX ROW Dalebrook lower strea	and Road Im scores.	CI
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  M Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  80%  1.2  80%  0.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.6  20% 1.2  zes, water velocii	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 10% 0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the	ts of length & wide  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel olds, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>> CSX ROW Dalebrook lower strea	and Road Im scores.	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the % Right Bank  Left Bank  Jundercut banks,	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  80%  1.2  80%  0.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.6  20% 1.2  zes, water velocii	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 10% 0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provinced to the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the	ts of length & wide  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel olds, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	Cl= (Sum % RA * S	and Road Im scores.	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  80%  1.2  80%  0.5  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.6  20% 1.2  zes, water velocit exes, stable featu	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. ( In the blocks below 10% 0.5  Low ty and depths; wo res.  Conditiona ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicate the control of the cont	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (bth > 3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & wide  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 1005  Low 1009  100%	Cl= (Sum % RA * S	and Road Im scores.	
Condition Scores  Delineate rip descriptors. Left Bank  Left Bank  Left Bank  INSTREAl undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree conon-maintained un located within th  1.  arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> root mats; SAV; r  Opti Habitat elements a	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri 80% 1.2  80% 0.5  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.6  20% 1.2  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 10% 0.5  ty and depths; wo res.  Conditiona ptimal ments are typically % of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (bdh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you  ginal ments are typically & of the reach and	ts of length & wide  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  Blocks en  Habitat elements lacking or are ur	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	Cl= (Sum % RA * S	and Road Im scores.	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi. root mats; SAV; r  Opti Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri 80% 1.2  80% 0.5  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 10% 0.6  20% 1.2  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 10% 0.5  ty and depths; wo res.  Conditional pptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & wid  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  Blocks en  High  Deliver to the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%  101%	Cl= (Sum % RA * S	and Road Im scores.	CI 0.8

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor N/A CSX R4SB 02080206 3/24/2016 06STR-A18 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate CSX and Dalebrook Road lower the Negligible Minor Severe score. 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. recovered. CI SCORE 1.5 1.3 1.1 0.9 0.7 0.5 0.70 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

**INSERT PHOTOS:** 



Top Left: Culvert 08. Confluence of STR-13 (flowing straight), and STR-14 (joining from the right) Bottom Right: Typical view, facing northwest from Dalebrook Road

NC DWQ Stream Identification Form Version 4.11

06-STR-A-18

Date: 3/24/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.425661
Evaluator: L. Eggering, K. Astroth	County: Chesterfield	Longitude: -77.453889
Total Points: 25 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemera Intermittent Perennial	Other e.g. Quad Name:

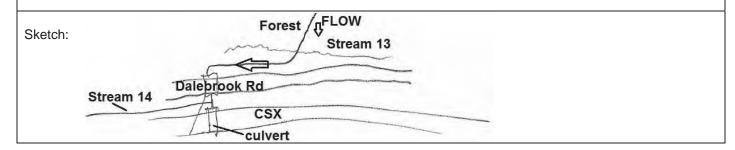
If ≥ 19 or perennial if ≥ 30"			ű	ŭ .		
				01		
A. Geomorphology (Subtotal = 7	Absent	Weak	Moderate	Strong		
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3		
2. Sinuosity of channel along thalweg	0	1	2	3		
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(-)	2	3		
Particle size of stream substrate	0	1	2	3		
5. Active/relict floodplain	0	1	2	3		
6. Depositional bars or benches		1	2	3		
7. Recent alluvial deposits	0	1	2	3		
8. Headcuts	0	1	2	3		
9. Grade control	0	0.5	1	1.5		
10. Natural valley	0	0.5	1	1.5		
11. Second or greater order channel	N	0 = 0	Yes :	= 3		
<sup>a</sup> artificial ditches are not rated; see discussions in manual						
B. Hydrology (Subtotal = 7)						
12. Presence of Baseflow	0	1	2	3		
13. Iron oxidizing bacteria	0	1_	(2)	3		
14. Leaf litter	1.5	0	0.5	0		
15. Sediment on plants or debris	0	0.5		1.5		
16. Organic debris lines or piles	0	0.5	1	1.5		
17. Soil-based evidence of high water table?	N	0 = 0	Yes :	= 3		

12. Presence of Basetlow	0	1		3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	lo = 0	Yes	= 3
C. Biology (Subtotal = 11 )				

C. Biology (Subtotal = <u>11</u> )				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	7	2	3
22. Fish	<b>O</b>	0.5	1	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5		1.5
26 Wetland plants in streambed		FACW = 0.75:	OBL = 1.5 Other = 0	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet: 18ASTR 13.



#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral stre Impact Cowardin **Project Name** HUC SAR# Project # Locality Date Class length Factor N/A DC2RVA - Area 06 ۷A R6 02080206 3/24/2016 Stream Name and Information Name(s) of Evaluator(s) L. Eggering & K. Astroth 06-STR-A-19 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable) **Conditional Category** NOTES>> Optimal Suboptimal Marginal Poor Stream between Low Marginal: Non-maintained High Poor: Lawns mowed, and railroad and High Suboptimal Riparian areas wit ree stratum (dbh Low Suboptimal: Riparian areas with ree stratum (dbh > Low Poor: Impervious surfaces, mine High Marginal: Non-maintained, dense herbaceous naintained areas Dalebrook Drive. nurseries; no-till egetation, riparia Poor riparian buffers. reas lacking shrub cropland; actively 3 inches) present with 30% to 60% 3 inches) present Tree stratum (dbh > 3 inches) present vegetation with and tree stratum. grazed pasture spoil lands. Field Sheet: 18-A-Riparian with >30% tree either a shrub layer or a tree layer (dbh 3 inches) present with <30% tree hay production, conds, open water of present, tree stratum (dbh >3 parsely vegetate non-maintained area, recently with > 60% tree canopy cove enuded surface anopy cover and maintained nderstory. Rece row crops, active feed lots, trails, or **Buffers** Wetlands STR-14. herbaceous and seeded and tabilized, or othe other comparable shrub layers or a non-maintained cutover (dense conditions. canopy cover. inches) present vegetation). with <30% tree comparable condition. understory. canopy cover with maintained understory. High Low High Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. Ensure the sums 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 90% 100% % Riparian Area> 10% Right Bank 0.75 0.5 CI= (Sum % RA \* Scores\*0.01)/2 % Riparian Area> 50% 50% 100% Rt Bank CI > 0.53 CI Left Bank 0.54 Lt Bank CI > 0.6 0.5 0.55 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number. THE REACH CONDITION INDEX (RCI) >> 0.27 RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF



**NC DWQ Stream Identification Form Version 4.11** 

## 06-STR-A-19

Date: 3/24/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.425415
Evaluator: L. Eggering, K. Astroth	County: Chesterfield	Longitude: -77.453754
<b>Total Points:</b> 18.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = $6.5$ )	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches		1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley		0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 5				
12. Presence of Baseflow	0	(1)	2	3
				_

12. Presence of Baseflow	0	1)	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	0 = 0	Yes :	= 3

C. Biology (Subtotal = 6.75

18. Fibrous roots in streambed	3	2	(1)	0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3	
21. Aquatic Mollusks	0	7	2	3	
22. Fish	<b>O</b>	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed	FACW = $0.75$ ; OBL = $1.5$ Other = $0$				

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream is a ditch between Dalebrook Drive and railroad. Stream into 18-A-STR-13 near culverts 8 & 9. Field Sheet: 18-A-STR-14, Stream 14.

Sketch:

Cul 8

STR-13

Cul 9

Dalebrook Dr

		Stre	Unit	fied Stream M	lethodology f	or use in Virg		m 1)			
Project #		Project Name		wadeable chan	nels classified a Cowardin	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact	
		-		,	Class.			JAN#	length	Factor	
N/A Nam	e(s) of Evaluat	C2RVA - Area		VA e and Informa	R2SB3	02080206	3/24/2016				
	gering & K. A	` '				R-A-20	(Kingslan	d Creek)			
. Channel C	ondition: Asse	ess the cross-sec	tion of the stream	n and prevailing c				,			
	Opti	imal	Subo	ptimal	Conditional Catego Mar	ry ginal	Po	or	Sev	ere	
		مريد	Cliability incincal f	ew areas of active		less than Severe or stable than Severe	Overwiden: Vertically/laterally		1	5	
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars' are present. Acce floodplain or fully bankfull benches. and transverse ba sediment depositio	n or natural rock, 00%). AND/OR bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient on covers less than	erosion or unproted of banks are st Vegetative protect prominent (60-Depositional feat stability. The bar channels are wellikely has access to or newly develope portions of the r	et aleas in active teached banks. Majority table (60-80%). Ition or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream to bankfull benches, d floodplains along reach. Transient is 10-40% of the	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran instability. Depositi stability, may be	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sisent, contribute on that contribute to forming/present. ed channels have	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/Of stream is covere Sediment is temp	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ad by sediment. orary/transient in puting to instability, ad channels have	Deeply incised vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underor protection present of banks, is not pre Obvious bank sk Erosion/raw ban AND/OR Aggradin, than 80% of stream	stability. Severe tained within the dd below average lajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%.	
	10% of	bollom.	stream	bottom.	banks and deposit	ion on > 40% of the ional features which to stability.	40% of the bar sediment depos		deposition, contrib Multiple thread of subterran	uting to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1		2.0
NOTES>>				Fi	ield Sheet:	18-A-STR-	15.				
. RIPARIAI	N BUFFERS: A	Assess both bank	d's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & wid	h may be accep	table)		
				ditional Cate			•		NOTES>>		
	Opti	imal	Subo	ptimal	Mar	ginal	Po	or			
Riparian Buffers		anopy cover and a derstory. Wetlands	containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree capop cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.		Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Condition	4	<u> </u>	High	Low		Low	High	Low			
escriptors.  Determine so	arian areas along on the state of the state	each stream ban each by measurin	g or estimating le	ngth and width. (	Calculators are pr	•	0.6  Ensure to of % R  Blocks e	iparian			
Right Bank	% Riparian Area>	90%	10%					100%			
	Score >	1.2	0.5						CI= (Sum % RA * S	cores*0.01)/2	
Left Bank	% Riparian Area>	90%	10%					100%	Rt Bank CI >	1.13	CI
	Score >	1.2	0.5						Lt Bank CI >	1.13	1.13
	M HABITAT: Va root mats; SAV; ri				ody and leafy deb	oris; stable substr	ate; low embeded	ness; shade;	NOTES>>		
Instream			1	Conditiona					Woody dek		
Habitat/	Opti	imal		ptimal ments are typically		ginal ments are typically	Po Habitat elements		VEIDOILIES	£ 11	
Available Cover	Habitat elements a in greater than 50	re typically present 0% of the reach.	present in 30-50%	% of the reach and r maintenance of	present in 10-309	% of the reach and or maintenance of	lacking or are ur elements are typical	stable. Habitat		_	
Score	1.		popul	ations.	popul	ations.	than 10% of	the reach.	-		1.50
	1 1.		1 1	.2		.9	0.	J	i		

Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB3	02080206	3/24/2016	06STR-A20		
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock  Conditional Category							NOTES>>		
	Negligible	Mi	nor	Mode	erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel alterations listed in	is disrupted by any of the channel	Greater than 8 disrupted by an alterations listed guidelines AND/0	in the parameter OR 80% of banks abion, riprap, or		

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: View of railroad bridge over creek

Top Right: Typical view upstream

Bottom Left: View of ATV trail damage to creek banks

Bottom Right: CSX train traveling over Kingsland Creek bridge

NC DWQ Stream Identification Form Version 4.11 Kingsland Creek 06-STR-A-20

Date: 3/24/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.408144
Evaluator: L. Eggering, K. Astroth	County: Chesterfield	Longitude: -77.454274
Total Points: 40 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

= 10 0. po. 0				
A O	Absort	Week	Madayata	Ctrong
A. Geomorphology (Subtotal = 18)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0		2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	N	o = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $\frac{7.5}{}$ )				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5

)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	No = 0 Yes = 3		
C Biology (Subtotal - 14.5				

C. Biology (Subtotal = $14.5$ )							
18. Fibrous roots in streambed	3	2	1	0			
19. Rooted upland plants in streambed	3	2	1	0			
20. Macrobenthos (note diversity and abundance)	0	1	2	(3)			
21. Aquatic Mollusks	0	(1)	2	3			
22. Fish	0	0.5	1	1.5			
23. Crayfish	0	0.5	1	1.5			
24. Amphibians	0	0.5		1.5			
25. Algae	0	0.5		1.5			
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0						

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Kingsland Creek. Varied substrate sizes, riffle/pool complexes. Field Sheet: 18-A-STR-15.

bridge Sketch: riffle woody debris sand bar

						or use in Virg					
Project #	ı	Project Name		Locality	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR	Impact Factor	
N/A	DC	2RVA - Area	06	VA	R2SB3	02080206	3/24/2016		length	racioi	
Name(	s) of Evaluat	or(s)	Stream Name	n Name and Information							
L. Egge	ering & K. A	stroth				06-STI	R-A-21				
1. Channel Co	ndition: Asse	ss the cross-sec	tion of the stream								
	Optimal		Subo	ptimal	onditional Category Marginal		Poor		Severe		
			Turk		Often incised, but less than Severe or		Overwidened/incised.				
Condition	100% stable bar surface protectior prominent (80-10 Stable point bars/h are present. Acce: floodplain or fully bankfull benches. and transverse ba	or natural rock, 100%). AND/OR 200%). AND/OR 300%). AND/OR 300%. AND/O	or natural rock, 19%). AND/OR 19%). AND/OR 20% and 20%		or Poor due to lower bank slopes. Forsion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute instability. Deposition that contribute		widen further. Majority of both banks		s Deeply included to exclavately, service and incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present.		
\$	sediment deposition 10% of b					AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which		vegetative protection is present on > 40% of the banks and stable		n bed is covered by uting to instability. channels and/or ean flow.	С
Score	3		2	.4		2	1.	.6	1	ı	2.0
	Opti		Con	ditional Categ	gory	ginal	its of length & width may be accept		NOTES>>		
Riparian	ree stratum (dbh > with > 60% tree ca oon-maintained unor located within the	nopy cover and a erstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Condition			High	Low	High	Low	High	Low			
Condition Scores	1.	5	1.2	1.1	0.85	0.75	0.6	0.5			
descriptors.  2. Determine squadelow.  3. Enter the % Rip	are footage for e	n areas along each stream bank into Condition Categories and Co re footage for each by measuring or estimating length and width. C arian Area and Score for each riparian category in the blocks below		Calculators are provided for you		Ensure the sums of % Riparian Blocks equal 100					
Right Bank	% Riparian Area> Score >	80% 1.1	20% 0.5					100%	21. (2		
	% Riparian Area>	50%	15%	15%	22%			102%	CI= (Sum % RA * So Rt Bank CI >	cores*0.01)/2 0.98	CI
Left Bank	Score >	1.1	0.85	0.75	0.5				Lt Bank CI >	0.90	0.9
3. INSTREAM					ody and leafy deb	oris; stable substr	ate; low embeded	lness; shade;	NOTES>>		
undercut banks; ro	ou mais; SAV; ri	nie poole comple	xes, stable reatul	res. Conditiona	l Category						
Habitat/	Opti	mal		ptimal ments are typically		ginal ments are typically	Po Habitat elements				
Available	Stable habitat elements are typically present in greater than 50% of the reach.  Stable habitat elements are typically present in 30-50% of the reach are adequate for maintenance of				present in 10-30%	% of the reach and	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less				
Available  - Cover				r maintenance of ations.	are adequate fo	r maintenance of ations.	elements are typic than 10% o			F	C

Stream Impact Assessment Form Page 2									
Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A	CSX VA		VA	R2SB3	02080206	3/24/2016	06STR-A21		
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock  Conditional Category  NOTES>>									
	Negligible	Mir	nor	Mode	erate	Sev	ere	er .	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed	00% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH									

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: Typical view of eroded stream at base of ballast Top Right: Typical view of stream in Kingsland Creek floodplain Bottom Left: Typical view of stream along base of ballast Bottom Right: View of stream from CUL-20, looking toward railroad

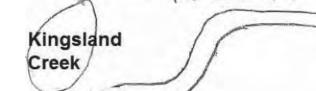
NC DWQ Stream Identification Form Version 4.11

### 06-STR-A-21

Date: 3/24/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.408141
Evaluator: L. Eggering, K. Astroth	County: Chesterfield	Longitude: -77.454164
<b>Total Points:</b> 30.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 14 )	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0		2	3
ripple-pool sequence		<u> </u>		
4. Particle size of stream substrate	0		(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5	$\bigcirc$	1.5
11. Second or greater order channel	(No	0 = 0	Yes =	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 6)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes =	= 3
C. Biology (Subtotal = 10.25)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5		1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		ACW = 0.75	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other method	ods. See p. 35 of manua			
Notes: Stream flows into Kingsland Creek. Strea			ot as high quality a	s downstrean
portions. Field Sheet: 18-A-STR-16.	•			

Sketch:



**⇔FLOW** 

		Stre		fied Stream M	lethodology f	or use in Virg	jinia	III I <i>)</i>			
Project #		Project Name		Locality	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	06	VA	R2SB	02080206	3/17/2016		longan	T doto!	
Nam	e(s) of Evalua	(s) of Evaluator(s) Stream Name and Inform		e and Informa							
J. Bu	ıdnik & K. As	stroth			06-ST	R-A-22	(Proctors	Creek)			
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream		ondition (erosion,						
	Optimal St		Subo	ptimal		ginal	Po	or	Sev	ere	
	1	WA PARKET				less than Severe or	Overwiden		1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or full) bankfull benches. and transverse ba	nks. Vegetative n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	ew areas of active cted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, of floodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe ewer bank slopes. seent on 40-60% of tative protection on Streambanks may creat. AND/OR 40- h is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the d by sediment. orary/transient in uting to instability.	Deeply incised vertical/lateral in incision, flow con banks. Streambe rooting depth, m ertical/underc protection present c banks, is not pre Obvious bank sit Erosion/raw ban AND/OR Aggrading	stability. Severe tained within the dd below average apority of banks ut. Vegetative in less than 20% of venting erosion. bughing present. ks on 80-100%.	
	sediment deposition 10% of	on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protecti 40% of the bar sediment depos	ks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	С
Score		3	2	4	:	2	1.	6	1		2.0
NOTES>>						18-B-STR-					
	N BUFFERS: /		Con	an areas along the	e entire SAR. (roo	ugh measuremen			table)		
	Opti Tree stratum (dbh: with > 60% tree ca	imal  > 3 inches) present, addrestory. Wetlands	Con	an areas along the	e entire SAR. (roo		ts of length & wid				
2. RIPARIAN Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cu. non-maintained un	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or			
2. RIPARIAN	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 2. Determine scorelow.	Tree stratum (dbh: with > 60% tree conon-maintained un located within the strain areas along quare footage for experience and quare footage for experience and quare footage f	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both abrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength area))	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a>30</a> % tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  1. Delineate ripidescriptors. 2. Determine scorelow.	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1.  arian areas along	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength area))	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a>30</a> % tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  1. Delineate ripa descriptors. 2. Determine scoelow. 3. Enter the % F	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream baneach by measurin Score for each ri 80% 1.1	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.85	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength area))	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a>30</a> % tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lols, trails, or other comparable conditions.  Low 0.5  Le sums imparian qual 100 100%	NOTES>>		~
Riparian Buffers  Condition Scores  1. Delineate ripa descriptors. 2. Determine scoelow. 3. Enter the % F	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 20%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutver (dense vegetation).  Low  1.1  Categories and Congth and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength and width. (dength areas with a particular areas with a particu	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a>30%</a> tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>	cores*0.01)/2 1.05 1.05	CI 1.09
Condition Scores  1. Delineate ript Jescriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree cz non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  M HABITAT: Vi	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin  Score for each ri  80%  1.1  80%  1.1  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.85	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below the present with the blocks below the present and congth and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dh) > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are prove.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with amaintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lols, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	1.05	
Condition Scores  1. Delineate ript Jescriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree ca non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  W Riparian Area> Score >  W HABITAT: V: root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin 80% 1.1  80% 1.1  aried substrate si iffle poole comple	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.85  20% 0.85	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or crops, active feed lots, trails, or conditions.  Low 0.5  Low 10.5  L	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.05	
Condition Scores  L. Delimeate rips descriptors. Left Bank  Left Bank  Left Banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  M HABITAT: Vi root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream baneach by measurin Score for each ri 80% 1.1  80% 1.1  aried substrate si iffle poole complesimal	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.85  20% 0.85  zes, water velocit exes, stable featur  Subo Stable habitat elei	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  W.  Il Category  Mary  Stable habitat ele	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  priss; stable substr ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  Blocks en  High  Deliver to the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.05	
Condition Scores  1. Delineate ripz descriptors. 2. Determine scoelow. 3. Enter the % f Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	Tree stratum (dbh: with > 60% tree co non-maintained un located within th  1. arian areas along uare footage for e Riparian Area and % Riparian Area> Score >  M HABITAT: Vi root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban each by measurin 80% 1.1 80% 1.1 aried substrate si iffle poole completimal re typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.85  20% 0.85  zes, water velocit exes, stable featur  Subo  Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (on the blocks below	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the canopy cover.  Stable habitat elepresent in 10-30% are adequate for a second control of the canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory. Low  0.75  sing the ovided for you  pris; stable substr	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-fill cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lols, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 0.5  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	1.05	

	St	ream In	pact A	ssessm	ent Fo	m Page	e 2										
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor								
N/A	CSX		VA			3/17/2016	06STR-A22										
	CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, bankments, spoil piles, constrictions, livestock  Conditional Category  Noclarate  Notes >> Railroad bridg Over stream.																
	Negligible	Mir	nor	Mod	Moderate		Severe		Severe		Severe		Severe		Severe		11.
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by am alterations listed guidelines AND/C shored with ga cem	of the channel in the parameter PR 80% of banks bion, riprap, or										
SCORE	1.5	1.3	1.1	0.9	0.7	0.	5										
	REACH C	ONDITION II	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH										

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

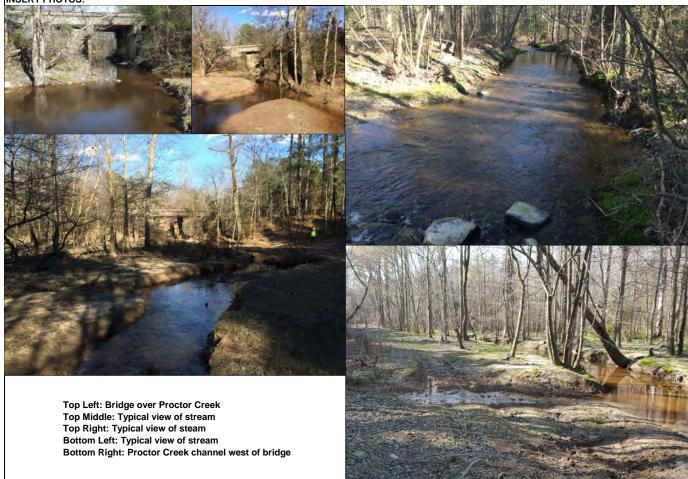
RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



### NC DWQ Stream Identification Form Version 4.11 Proctors Creek 06-STR-A-22

Date: 3/17/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.391471						
Evaluator: J. Budnik, K. Astroth	County: Chesterfield	Longitude: -77.453882						
<b>Total Points:</b> 38.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:						

0	1		Strong
Λ	· '	(2)	3
O	(1)	2	3
0	1	2	3
0	1	2	3
0	1	2	3
0	1	(2)	3
0	1	2	3
0	1	2	3
0	0.5	0	1.5
0	0.5	1	1.5
N	0 = 0	Yes =	= 3
	<del>,</del>		
0	1	2	(3)
0	1	(2)	3
1.5	1	0.5	0
0	0.5	(1)	1.5
0	0.5	1	1.5
(N	0 = 0	Yes =	= 3
3	(2)	1	0
(3)	2	1	0
0	1	(2)	3
0	1	(2)	3
0	0.5	$\Box$	1.5
0	0.5	1)	1.5
0	0.5	1	1.5
0	0.5		1.5
	FACW = 0.73; C	OBL = 1.5 Other = 0	)
e p. 35 of manua	al.		
. Field Sheet	:: 18-B-STR-02.		
	0 0 0 0 0 0 0 0 0 0 1.5 0 0 0 N	0 1 0 1 0 1 0 0.5 0 0.5 0 0.5 0 0 0.5 0 0 0.5 0 0 0.5 0 0 0.5 0 0 0.5 0 0 0.5 0 0 0.5 0 0 0.5 0 0 0.5 0 0 0.5 0 0 0.5 0 0 0.5 0 0 0.5 0 0 0.5 0 0 0.5 0 0 0.5 0 0.	0 1 2 0 1 0 1 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0 1 0

# Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

	For use in ephemeral streams									
Project #	Project Name	Cowardin Class.	HUC Date		SAR#	Impact/SAR length	Impact Factor			
N/A	DC2RVA - Area 06	VA	R6	02080206	3/17/2016					

Name(s) of Evaluator(s) Stream Name and Information

J. Budnik & K. Astroth

06-STR-A-23

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

	Conditional Category									
	Optimal	Subor	otimal	Mar	ginal	Po	oor	Field Shee		
Riparian with	se stratum (dbh > 3 inches) present, th > 60% tree canopy cover <mark>and an</mark> n-maintained understory. Wetlands areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a stree layer (dbh > 3 inches) present, with <30% tree canopy cover:	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	STR-03.		
		High	Low	High	Low	High	Low			
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5			
Delineate riparian descriptors.	n areas along each stream bank	into Condition C	ategories and Co	ndition Scores us	sing the	Ensure t	the sums			
	re footage for each by measuring	g or estimating ler	ngth and width. C	Calculators are pr	ovided for you	of % F	Riparian			
3. Enter the % Ripar	arian Area and Score for each rip	parian category in	the blocks below	٧.		Blocks e	qual 100			
Right Bank % F	Riparian Area> 15%	15%	70%				100%			
right Bank	Score > 1.2	0.6	0.5							
								CI= (Sum % RA * S	Scores*0.01)/2	
Left Bank	Riparian Area> 100%						100%	Rt Bank CI >	0.62	CI
Left Dalik	Score > 1.2							Lt Bank CI >	1.20	0.91

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

THE REACH CONDITION INDEX (RCI) >>

RCI= (Riparian CI)/2

0.46

0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:



**NC DWQ Stream Identification Form Version 4.11** 

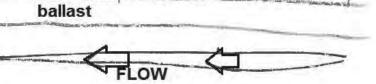
06-STR-A-23

Date: 3/17/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.389713
Evaluator: J. Budnik, K. Astroth	County: Chesterfield	Longitude: -77.454371
<b>Total Points:</b> 17.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral ntermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 7)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence				
4. Particle size of stream substrate	0	$\bigcirc$	2	3
5. Active/relict floodplain	0	1	2)	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	Ū	(1)	2	3
8. Headcuts	0		2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	(No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 4	<del> </del>			
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1_	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
C. Biology (Subtotal = 6.25 )				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	<b>O</b>	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.73;	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other meth	nods. See p. 35 of manua	al.		
Notes: Ephemeral stream that flows into 18-B-W	-			

Sketch:

WTL-01



	Ephe	mera		fied Stream N	lethodology f	ment for use in Virg		(For	n 1a)		
Project #		Project Name	9	Locality	e in ephemeral s Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	06	VA	R6	02080206	3/10/2016		lengur	1 actor	
	e(s) of Evalua ering & D. N		Stream Nam	e and Informa	ation	06-STI	R-S-01				
39	,g					00 011					
2. RIPARIAN	N BUFFERS: /	Assess both bank				gh measurements	of length & width	may be acceptab			
ļ	Opti	imal		ditional Cate ptimal		ginal	Po	oor	NOTES>> Field Shee	t: 16-A-	
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca non-maintained und are	nopy cover and an derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.2007/stree">30</a> % tree canopy cover.	lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	STR-1.		
Condition	1.	E	High 1.2	1.1	High 0.85	0.75	High 0.6	0.5			
2. Determine squ below.	arian areas along e uare footage for ea Riparian Area and % Riparian Area> Score >	each stream bank ach by measuring	into Condition Ca	tegories and Cong	dition Scores usin	g the descriptors.	Ensure to	che sums Riparian equal 100 100%			
	1		0.0						CI= (Sum % RA * S		
Left Bank	% Riparian Area>	100% 0.75						100%	Rt Bank CI >	0.57 0.75	0.6
		REACH C	ONDITION I	NDEX and S	TREAM CO	NDITION UN	ITS FOR TH	IS REACH			
NOTE: The CIs and P	RCI should be rounded	d to 2 decimal places.	. The CR should be ro	unded to a whole nun	nber.				ONDITION IND	, ,	0.3
									CI= (Riparian CI ON REQUIREM		0
NSERT PHO								CR = RCI	X LF X IF		
DESCRIBE F	PROPOSED IN	ІРАСТ:									

NC DWQ Stream Identification Form Version 4.11

06-STR-S-01

Date: 3/10/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.559808
Evaluator: L. Eggering & D. Mitchell	County: Richmond (city)	Longitude: -77.452986
<b>Total Points:</b> 16 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral ntermittent Perennial	Other e.g. Quad Name:

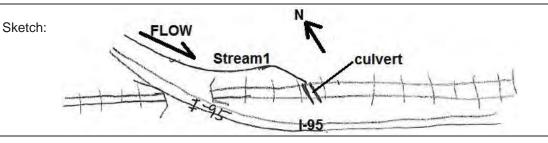
if ≥ 19 or perennial if ≥ $30^*$	Epnemeral	rmittent Perenni	ai e.g. Quad Name:	
A. Geomorphology (Subtotal = 5)	Absent	Weak	Moderate	Strong
,		Weak		
1 <sup>a.</sup> Continuity of channel bed and bank	0		2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	$\bigcirc$	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	<b>(</b> 0 <b>)</b>	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1)	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $5$				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1_	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
0.01.1 (0.11.1.1.0)				

13. ITOTI OXIGIZING DACTERIA		· '		3
14. Leaf litter	1.5	1_	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	o = 0	Yes	= 3
C. Biology (Subtotal = 6				

C. Biology (Subtotal = 6				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	(1)	1.5
26. Wetland plants in streambed		FACW = 0.75: (	OBL = 1.5 Other = 0	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Field Sheet: 16-A-STR-1.



	,	Stre					(For	m 1)			
				fied Stream N wadeable chan							
Project #	Proje	ject Name		Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RV	/A - Area	06	VA	R2SB	02080206	3/14/2016				
	e(s) of Evaluator(s	s) of Evaluator(s) Stream Name and Information									
	udnik & K. Astrot						R-S-02				
. Channel C	Condition: Assess the	ne cross-sect	tion of the stream		ondition (erosion, conditional Catego						
	Optimal		Subo	ptimal	Mar	ginal	Poor Severe		Severe		
	"We was	WA	The state of the s		Often incised, but less than Severe or Poor. Banks more stable than Severe		Overwidened/incised. Vertically/laterally unstable. Likely to				
Channel Condition	Very little incision or active 100% stable banks. V surface protection or na prominent (80-100%). Stable point bars/bankfu are present. Access to the floodplain or fully devel- bankfull benches. Mid-ct- and transverse bars few	Vegetative atural rock, . AND/OR full benches their original eloped wide channel bars,	erosion or unprotect of banks are st Vegetative protect prominent (60- Depositional feat stability. The ban channels are well likely has access to or newly develope:	ew areas of active cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream to bankfull benches, d floodplains along	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be isient, contribute on that contribute to	widen further. Maji are near vertical. E 60-80% of banl protection preses banks, and is insu erosion. AND/Of stream is covere Sediment is temp nature, and contrik	rosion present on cs. Vegetative nt on 20-40% of fficient to prevent c 60-80% of the d by sediment. orary/transient in outing to instability.	Legy interest of excellent of the second of excellent of the second of excellent of the second of excellent of the second of excellent of the second of excellent of the second of excellent of the second of excellent of excelle		
	sediment deposition cove 10% of bottom	ers less than	sediment cover	reach. Transient is 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have ion on > 40% of the ional features which to stability.	AND/OR V-shape vegetative protecti 40% of the bar sediment depos	on is present on > iks and stable			CI
Score	3		2.4			2	1.	6	1	1	1.6
. RIPARIAI	N BUFFERS: Assess	ss both bank			e entire SAR. (ro	·B-STR-01.	ts of length & widt	h may be accep			
	Optimal	1		ditional Cate	gory						
	0		Suboi	ptimal	Mar	ginal	Po	or	NOTES>>	n hoth	
Riparian Buffers	Tree stratum (dbh > 3 inct with > 60% tree canopy on-maintained understor located within the ripari	ches) present, cover and a ory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor:	Railroad or sides of ca St. off left I Roads elev canal.	nal. Dock bank.	
•	with > 60% tree canopy of non-maintained understor	ches) present, cover and a ory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a href="https://doi.org/10.100/bit/30/">https://doi.org/10.100/bit/30/"&gt;https://doi.org/10.100/bit/30/https://doi.org/10.100/bit/30/<td>High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable</td><td>Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable</td><td>Railroad or sides of ca St. off left I Roads elev canal.</td><td>nal. Dock bank.</td><td></td></a>	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	Railroad or sides of ca St. off left I Roads elev canal.	nal. Dock bank.	
Buffers  Condition	with > 60% tree canopy of non-maintained understor	ches) present, cover and a ory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.	Railroad or sides of ca St. off left I Roads elev canal.	nal. Dock bank.	
Condition Scores  Delineate ripiescriptors. Determine scielow.	with > 60% tree canopy on non-maintained understor located within the ripari located within the ripari located within the ripari located within the ripari located within the ripari located within the ripari located within the ripari located within the ripari located within the ripari	ches) present, cover and a ry. Wetlands rian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  sinto Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	Railroad or sides of ca St. off left I Roads elev canal.	nal. Dock bank.	
Condition Scores  Delineate rip: escriptors. Determine so	with > 60% tree canopy on non-maintained understor located within the ripari located within the ripari located within the ripari located within the ripari located within the ripari located within the ripari located within the ripari located within the ripari located within the ripari	ches) present, cover and a ry. Wetlands rian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  sinto Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure te of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	Railroad or sides of ca St. off left I Roads elev canal.	nal. Dock bank. vated over	
Condition Scores  Delineate rip: escriptors. Determine scelow. Enter the % I	with > 60% tree canopy on non-maintained understor located within the ripari located within the	stream bank by measuring e for each rig 100% 0.5	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  sinto Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure te of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  The sums sparian qual 100 100%	Railroad or sides of ca St. off left I Roads elev canal.	onal. Dock bank. vated over	6
Condition Scores  Delineate rip: escriptors. Determine scelow. Enter the % I	with > 60% tree canopy on non-maintained understor located within the ripari located within the	ches) present, cover and a ry. Wetlands rian areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  sinto Condition C	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure te of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	Railroad or sides of ca St. off left I Roads elev canal.	nal. Dock bank. vated over	CI 0.50
Condition Scores  Delineate riprescriptors. Determine scelow. Enter the % I Right Bank  Left Bank  I INSTREAL	with > 60% tree canopy on non-maintained understor located within the ripari located within the	stream bank by measuring e for each rig 100% 0.5 substrate siz	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition C g or estimating len parian category in	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Sategories and Co ngth and width. Co n the blocks below  y and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High 0.85 Indition Scores us Calculators are proved.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, so production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	Railroad or sides of ca St. off left I Roads elev canal.	cores*0.01)/2	
Condition Scores  Delineate rip. lescriptors. Determine scelebw. Enter the % I Right Bank  Left Bank  Left Bank  INSTREAI	with > 60% tree canopy on non-maintained understor located within the ripari located within the	stream bank by measuring e for each rig 100% 0.5 substrate siz	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition C g or estimating len parian category in	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Sategories and Co ngth and width. Co n the blocks below  y and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Academic Scores us Calculators are prov.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, so production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	Railroad or sides of ca St. off left I Roads elev canal.  Cl= (Sum % RA*S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2	
Condition Scores  Delineate ripiescriptors. Determine scietow. Enter the % I Right Bank  Left Bank  B. INSTREAI	with > 60% tree canopy on non-maintained understor located within the ripari located within the	stream bank by measuring e for each rig 100% 0.5 substrate sizeoole comple	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 sinto Condition C g or estimating let parian category in  test of the condition of the conditio	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and County and the blocks below  ty and depths; wo res.  Conditiona ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the conditi	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, traits conditions.  Low 0.5  Low 10.5  Low 100%  100%	Railroad or sides of ca St. off left I Roads elev canal.  Cl= (Sum % RA*S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2	
Condition Scores  Delineate riplescriptors. Determine scores  Enter the % I Right Bank  Left Bank  B. INSTREAI Indercut banks; Instream Habitat/ Available	with > 60% tree canopy on non-maintained understor located within the ripari located within the	stream bank by measuring e for each rig 100% 0.5 substrate sizeoole comple	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating let parian category in  zes, water velocit xes, stable featur  Subop Stable habitat eler present in 30-50% are adequate for	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicate the canopy cover with the canopy cover.  Calculators are provided the canopy cover with the canopy cover with the canopy cover.  Stable habitat elepresent in 10-30% are adequate for a tree that the canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present, tree stratum (dbh > 3 inches) present tree stratum (dbh > 3 inche	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks etc.  Blocks etc.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%  100%  Interest shade;  or listed above are stable. Habitat	Railroad or sides of ca St. off left I Roads eleveranal.  Cl= (Sum % RA*S Rt Bank Cl > Lt Bank Cl > NOTES>>	cores*0.01)/2	0.50
Condition Scores  Delineate ripi lescriptors. Descriptors. Descriptors. Determine scoletow Right Bank  Left Bank  Left Bank  Instream Habitat/	with > 60% tree canopy on non-maintained understor located within the ripari located within the	stream bank by measuring e for each rig 100% 0.5 substrate sizeoole comple	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  Into Condition C g or estimating let parian category in  zes, water velocit xes, stable featur  Subop  Stable habitat elet present in 30-509 are adequate for populi	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Counthe blocks below  by and depths; wo res.  Conditiona ptimal ments are typically 6 of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provided to the second of the second	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically & of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R Blocks end Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%  100%  100%	Railroad or sides of ca St. off left I Roads eleveranal.  Cl= (Sum % RA*S Rt Bank Cl > Lt Bank Cl > NOTES>>	cores*0.01)/2	

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point Project # Date SAR length Impact Factor N/A CSX R2SB 02080206 3/14/2016 06STR-S02 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. is disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has been guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not cement. guidelines. guidelines. recovered. recovered. CI SCORE 1.5 1.3 1.1 0.9 0.7 0.5 0.50

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:





Top Left: Typical view of stream and railroad under overpass, looking east Top Right: Typical view of railroad and stream under overpass, looking west Bottom Left: View of stream, west toward overpass

NC DWQ Stream Identification Form Version 4.11

06-STR-S-02

Date: 3/14/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.531036
Evaluator: J. Budnik, K. Astroth	County: Chesterfield	Longitude: -77.428704
Total Points: 30 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitter Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 9	Absent	Weak	Moderate	Strong
a. Continuity of channel bed and bank	0	1	2	3
. Sinuosity of channel along thalweg	0	(1)	2	3
. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
. Particle size of stream substrate	0	1	2	3
. Active/relict floodplain	0	1	2	3
. Depositional bars or benches	0	(1)	2	3
. Recent alluvial deposits	0	<b>(T)</b>	2	3
. Headcuts	0	1	2	3
. Grade control	0	0.5	1	1.5
0. Natural valley		0.5	1	1.5
Second or greater order channel	No	0 = 0	Yes:	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 6.5 )				
2. Presence of Baseflow	0	1	2	(3)
3. Iron oxidizing bacteria	(0)	1	2	3
4. Leaf litter	1.5	1	0.5	0
5. Sediment on plants or debris	0	0.5	1	1.5
6. Organic debris lines or piles	0	0.5		1.5
7. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = <u>14.5</u> )				
8. Fibrous roots in streambed	(3)	2	1	0
9. Rooted upland plants in streambed	(3)	2	1	0
Macrobenthos (note diversity and abundance)	0	1	(2)	3
1. Aquatic Mollusks	0	1	2	3
2. Fish	0	0.5	1	1.5
3. Crayfish	0	0.5	(1)	1.5
4. Amphibians	0	0.5	1	1.5
5. Algae	0	0.5		1.5
o. Algae	·	EACM 0.75.	OBL = 1.5 Other = 0	
6. Wetland plants in streambed		FACVV = 0.75	OBL = 1.5 Other = 0	<u> </u>
-		l.		

		Stre				Form	) (For	m 1)			
					nels classified a	s intermittent or	perennial		Impact/SAR	Impact	
Project #	l	Project Name	•	Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R2SB	02080206	3/14/2016				
	e(s) of Evalua Inik & K. A	` '	Stream Nam	e and Informa		TD C 02	0 / 1	D:\			
			for the state of	1			a (James	River)			
. Channel C	ondition: Asse			C	Conditional Catego	ry					
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	" was		Slightly incised fa	ew areas of active		less than Severe or stable than Severe	Overwidend		Deeply incised	(or even steet)	
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully	Slightly incised, few areas of active acrosion or natural rock, stable banks. Vegetative protection or natural rock minent (80-100%). AND/OR le point bars/bankfull benches resent. Access to their original polain or fully developed wide ull benches. Mid-channel bars, likely has access to bankfull benches, or newly developed floodplains along in roll will developed wide ull benches. Mid-channel bars, likely has access to bankfull benches, or newly developed floodplains along instable Like. Brossion ras y be present on 40-60% of both banks. Streambanks may be vertical or undercut. AND/OR 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% of barks. Totambanks may be vertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be sediment. Sediment may be sediment. Sediment may be sediment. Sediment may be sediment semporary/transient, contribute to stability. The bankfull benches, or newly developed floodplains along instability. Deposition that contribute to stability. The bankfull benches, or newly developed floodplains along instability. Deposition that contribute to the program of the p		rosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sk. Erosion/raw ban	stability. Severe tained within the do below average tajority of banks ut. Vegetative in less than 20% of venting erosion. Dughing present. ks on 80-100%.					
	sediment depositio	of transverse dars few. I fransient imment deposition covers less than 10% of bottom.  Transient sediment covers 10.40% of the stream bottom.  Steam bottom.  Stability, may be forming/present.  AND/OR V-shaped channels have vegetative protection on > 40% of the bank and depositional features which contribute to stability.  AND/OR V-shaped vegetative protection on > 40% of the bank sediment deposition.		on is present on > aks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	CI				
Score	3	1	2	.4		2	1.	6	1		2.0
NOTES>>				Fi	ield Sheet:	14-B-STR-	01.				
. RIPARIAN	N BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt	h may be accep	table)		
				ditional Cate					NOTES>>		
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or			
Riparian Buffers	Tree stratum (dbh > with > 60% ree conon-maintained und located within the	nopy cover and a derstory. Wetlands	containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree cappy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Condition		_	High	Low	High	Low	High	Low			
escriptors.	arian areas along o	each stream ban				•	0.6  Ensure the of % R				
	Riparian Area and			n the blocks below	N.		Blocks e				
Right Bank	% Riparian Area> Score >	50% 0.6	50% 0.5					100%	-		
	I	7001	0501					40001	CI= (Sum % RA * S		
Left Bank	% Riparian Area>	70% 0.5	30% 0.6					100%	Rt Bank CI >	0.55 0.53	0.54
	<b>/I HABITAT:</b> Va	aried substrate si	zes, water velocit		ody and leafy deb	oris; stable substr	ate; low embeded	ness; shade;	NOTES>>		
ndercut banks;	root mats; SAV; ri			res.	al Category						
Instream Habitat/	Opti	mal		ptimal	Mar	ginal	Po				
Available	Habitat elements a		present in 30-50%	ments are typically 6 of the reach and	present in 10-309	ments are typically % of the reach and	Habitat elements lacking or are ur	stable. Habitat			
Cover	in greater than 50	U% of the reach.		r maintenance of ations.		r maintenance of lations.	elements are typica than 10% of			İ	CI
Score	1.	_		.2		.9	0.			ļ	0.90

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point Project # Date SAR length Impact Factor N/A CSX R2SB 02080206 3/14/2016 06STRS03a 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate Negligible Minor Severe 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. is disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has been guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable cement. guidelines. guidelines. stream meander pattern has not recovered. recovered. CI SCORE 1.5 1.3 1.1 0.9 0.7 0.5 1.10

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole numbe

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:





Top Left: View upstream toward railroad bridge from data point
Top Right: View upstream toward railroad bridge from data point
Bottom Left: View of confluence of stream from north with James River at data point location
Bottom Right: view of culvert carrying stream from north, joining James River

NC DWQ Stream Identification Form Version 4.11 James River 06-STR-S-03a

THE BYY Q BUT CAIM THE HUMBER COUNTY OF THE VEH	51011 1011	
Date: 3/14/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.530525
Evaluator: J. Budnik, K. Astroth	County: City of Richmond	Longitude: -77.430914
<b>Total Points:</b> 38.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 16.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool,	0		2	3
ripple-pool sequence				_
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	<u> </u>	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $\frac{7.5}{}$ )			_	
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = $\underline{14.5}$ )				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	(2)	3
22. Fish	0	0.5	1	(1.5)
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other method	ods. See p. 35 of manua	al.		
Notes: James River. Field Sheet: 17-B-STR-01.	•			
Sketch:				
	<b>D</b>			
Ja	mes Stor	rmwater	1	
	O LO		D Cul 4	
	n -	y 17.	-B-Cul-1	
	417			
	V			

		Stre			sment Methodology f		) (For	m 1)			
					nels classified a				1010	•	
Project #		Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	06	VA	R2SB	02080206	3/14/2016				
Nam	e(s) of Evaluator(s) Stream Na			e and Informa			<u>'</u>				
J. Bud	dnik & K. A	stroth			06-ST	TR-S-03	<b>b</b> (James	River)			
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream	and prevailing c	ondition (erosion,	aggradation)					
	Opt	imal	Subo	ptimal	Conditional Catego Mar	ginal	Po	or	Sev	ere	
	The state of the s		The state of the s			less than Severe or	Overwiden		5		
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars, are present. Acce floodplain or fully bankfull benches. and transverse ba	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along		or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositiv stability, may be	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	Severe Vertically/laterally unstable. Likely to opes. widen further. Majority of both banks tion on 60-80% of banks. Vegetative ks may DR 40-banks, and is insufficient to prevent by be stream is covered by sediment. Sediment is temporary/transient in inbute to nature, and contributing to instability.		Deeply incised vertical/lateral in incision, flow cor banks. Streambe rooting depth, ru vertical/lunderc protection present obanks, is not pre Obvious bank sl. Erosion/raw ban AND/OR Aggradin	stability. Severe tained within the do below average tajority of banks ut. Vegetative in less than 20% of venting erosion. Sughing present. It is on 80-100%.	
	10% of	bottom.	portions of the reach. Transient sediment covers 10-40% of the stream bottom.		vegetative protecti banks and depositi contribute	ed channels have ion on > 40% of the ional features which to stability.			than 80% of stream deposition, contrib Multiple thread subterran	uting to instability. channels and/or ean flow.	(
Score	3	3	2	.4	]	2	1.	6	1		2
2. RIPARIAI	N BUFFERS: /	Assess both bank	•	an areas along the	· · ·	ugh measuremen	ts of length & wid	th may be accep	table)		
	Opt	imal		ptimal		ginal	Po	or	Gravel Roa	d runs	
Riparian Buffers	with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.	containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with ~30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	parallel wit stream/bas Railroad ci stream/bas	h sin. osses	
Condition			High	Low	High	Low	High	Low			
Scores  1. Delineate ripadescriptors.	arian areas along			•		•	0.6 Ensure to	0.5			
below.	quare footage for e	Score for each ri	parian category in	the blocks belov	·	ovided for you	of % R Blocks e	i e			
Right Bank	% Riparian Area>	25% 0.85	40% 0.75	35% 0.6				100%			
			4.6.7.	2677	455			40	CI= (Sum % RA * S		_
Left Bank	% Riparian Area>	55% 0.85	10% 0.75	20% 0.6	15% 5			100%	Rt Bank CI >	0.72 1.41	1.0
	M HABITAT: Va	aried substrate si	zes, water velocit	y and depths; wo		oris; stable substr	ate; low embeded	lness; shade;	NOTES>>	1.41	1.
Instream			1	Conditiona		ein al					
Habitat/ Available	Habitat elements a	imal  re typically present	Stable habitat eler present in 30-50%	ptimal ments are typically 6 of the reach and	Stable habitat ele present in 10-30%	ginal ments are typically % of the reach and	Habitat elements lacking or are ur	listed above are stable. Habitat			
					<ul> <li>are adequate for</li> </ul>	r maintenance of	elements are typical	ally procent in lace			
Cover	in greater than 5	.5		ations.	popul	ations.	than 10% o	f the reach.			0.

Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX	CSX		R2SB	02080206	3/14/2016	06STRS03b		
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock  Conditional Category									
	Negligible	Mi	nor	Mod	oderate Severe				
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	90% of reach is y of the channel in the parameter PR 80% of banks bion, riprap, or nent.		
				recovered.	iccovered.				

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

0

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: View from north side of James River Top Right: View from south side of James River Bottom Left: View from south side of James River Bottom Right: View from south side of James River

NC DWQ Stream Identification Form Version 4.11 James River 06-STR-S-03b

110 D 11 Q Dollaring Later Later 1 of the 1 of the 101 to 111							
Date: 3/14/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.530525					
Evaluator: J. Budnik, K. Astroth	County: City of Richmond	Longitude: -77.430914					
<b>Total Points:</b> 38.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:					

0 0 0 0 0 0 0 0	1 1 1 1 1 1 1 0.5	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 3 3 3 3 3 3
0 0 0 0 0 0	1 1 1 1	2 2 2 2 2 2	3 3 3 3 3
0 0 0 0 0	1 1 1	2 2 2 2 2 2	3 3 3 3
0 0 0 0 0 0 0	1 1	2 2 2	3 3 3
0 0 0	1	2 2 2	3
0 0	1	2	3
0	<u> </u>	2	
0	<u> </u>		3
•	0.5		5
0		1	1.5
	0.5		1.5
No = 0		Yes = 3	
	<u>'</u>		
0	1	2	(3)
0	(1)	2	3
1.5)	1	0.5	0
0	0.5	(1)	1.5
0	0.5		1.5
No = 0		Yes = 3	
3	2	1	0
3)	2	1	0
0	1	2	3
0	1	(2)	3
0	0.5	1 (	1.5
0	0.5	(1)	1.5
0	0.5		1.5
0	0.5		1.5
FA	CW = 0.75; OBL =	= 1.5 Other = 0	
5 of manual.			
	0 0 0 0 No = 0	0	0

Conditional Category	Project 8 Project Name   Locality Covering   HUC   Date   SAR #   Impact   Sacrot   Class   Name   College   Covering   HUC   Date   SAR #   Impact   Sacrot		•-	mera						· (. •	α,	
Name(s) of Evaluator(s)   Stream Name and Information	NA DC2RVA - Area 6 VA R6 0200026 91932016   Stream Name and Information L. Postaski; R. Mangnum  Conditional Category  Category  Category  Category  Category  Category  Category  Category  Category  Category  Category  Category  Category  Cat						e in ephemeral s		gIW			
L. Postaski; R. Mangnum  Conditional Category  Optimal Suboptimal High Suboptimal Riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal High Suboptimal Riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal High Suboptimal Riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal High Suboptimal Riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)  NOTES>> The right decending bank is the railroad ballast. The stream bank in the stratum (dish > 3 inches) present, with 30% reserved of widerstory. Wellands a maintained understory. Wellands a maintained understory. Wellands a maintained understory. Wellands a maintained understory. Wellands (rough measurements of length & width may be acceptable)  NOTES>> The right decending bank is the railroad ballast. The stream bank in the stratum (dish > 3 inches) present, with 30% reserved and non-maintained understory. Wellands a maintained understory. Wellands a maintained understory. Wellands (rough measurements of length & width may be acceptable)  Condition a maintained understory. High More maintained understory. High More maintained understory. High More maintained understory. Well of the comparable of the present, with 30% reserved and non-maintained understory. Wellands (rough measurements of length & width may be acceptable.  Condition a maintained with season and maintained understory. High More maintained understory. High More maintained understory. Wellands (rough measurements of length & width in the railroad ballast. The stream ball with season and maintained understory. Wellands (rough measurements of length & low Marginal More maintained understory. High More maintained understory. High More maintained understory. High More maintained understory. High More maintained understory. Hig	Name(s) of Evaluator(s)  L Postaski; R. Mangnum  O6-STR-S-04  RIPARIAN BUFFERS: Assess both bacin's 100 flori iparian areas along the effice SAR. (rough measurements of length & width may be acceptable)  Conditional Category  Optimal Suboptimal Marginati Twe Waspital Waspi	Project #	F	Project Name	•	Locality		HUC	Date	SAR#		
2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)    Conditional Category	E. RIPARIAN BUFFERS: Accesses both barriers 100 foot riparana atease along the entire SAR. (rough measurements of longth & width may be acceptable)  Conditional Category.  Riparian Buffers  Riparian Buffers  Riparian Buffers  Conditional Category.  The distinute (sh - 3 inched) percept. (present) with the silicing of the control and	N/A	DC	2RVA - Area				02080206	9/13/2016			
Conditional Category    Conditional Category	Conditional Category  Category  Category  Category  Conditional Category  Category  Category  Category  Category  Category  Category  Category  Category  Category  Category  Category  Category  Category  Category  Catego				Stream Nam	e and Informa	ation					
Conditional Category   Companies   Conditional Category   Catego	Optimal Suboptimal High Buboplants (1982) and the relation of the control of the	L. Pos	taski; R. Mar	ngnum				06-ST	R-S-04			
Comparison   Com	Committee   Comm	RIPARIAN	N BUFFERS: A	ssess both bank	c's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	its of length & wid	th may be accept	able)	
High Suboptimate Repairs a rease with rese stratum (dbh > 3 inches) present, with 50% tree canopy cover and an non-maintained understory. Wetlands areas.  Which service with 10 months of the stratum (dbh > 3 inches) present, with 50% tree canopy cover and an non-maintained understory. Wetlands areas.  Which service with 10 months and areas.  Which service with 10 months and areas and shrub layers or a non-maintained understory. Wetlands areas.  Which service with 10 months and areas and shrub layers or a non-maintained understory. Wetlands areas.  Which service with 10 months and areas and shrub layers or a non-maintained understory. Wetlands areas.  Which service with 10 months and areas and shrub layers or a non-maintained understory. Wetlands areas.  Which service with 10 months and areas and shrub layers or a non-maintained understory. Wetlands areas.  Which service with 10 months areas and shrub layers or a non-maintained understory. Wetlands areas. Wetla	High Suboptimate Right Subopti				Con	ditional Cate	gory				NOTES>>	
Riparian areas along each stream bank into Condition Categories and Condition Scores using the Seriptors.  Defined the Riparian areas along each stream bank into Condition Categories and Condition Scores using the Seriptors.  Enter the % Riparian areas along each stream bank into Condition Categories and Condition Scores using the Seriptors.  Enter the % Riparian areas along each stream bank into Condition Categories and Condition Scores using the Seriptors.  Enter the % Riparian areas and Score for each riparian category in the blocks below.  Enter the % Riparian Areas and Score for each riparian category in the blocks below.  Enter the % Riparian Areas and Score for each riparian category in the blocks below.  Enter the % Riparian Areas and Score for each riparian category in the blocks below.  Enter the % Riparian Areas and Score for each riparian category in the blocks below.  Enter the % Riparian Areas and Score for each riparian category in the blocks below.  Enter the % Riparian Areas and Score for each riparian category in the blocks below.  Enter the % Riparian Areas and Score for each riparian category in the blocks below.  Enter the % Riparian Areas and Score for each riparian category in the blocks below.  Enter the % Riparian Areas and Score for each riparian category in the blocks below.  Enter the % Riparian Areas and Score for each riparian category in the blocks below.  Enter the % Riparian Areas and Score for each riparian category in the blocks below.  Enter the % Riparian Areas and Score for each riparian category in the blocks below.  Enter the % Riparian Areas and Score for each riparian category in the blocks below.  Enter the % Riparian Areas and Score for each riparian category in the blocks below.  Enter the % Riparian Areas and Score for each riparian category in the blocks below.  Enter the % Riparian Areas and Score for each riparian category in the score for the score for each riparian category in the score for each riparian category in the score for each riparian category in the s	Riparian Buffers  Condition Scores  1.5  1.2  1.1  0.85  0.75  0.86  0.55  Defermen square footige of each tymeward and Score for each tymeward and Score for each tymeward and Score for each tymeward and Score for each tymeward and Score for each tymeward and Score for each tymeward and Score for each tymeward and Score for each tymeward and Score for each tymeward and Score for each tymeward and Score for each tymeward and Score for each tymeward for each t		Opti	mal	Subo	ptimal	Mar			oor		
Condition Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the escriptors.  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the escriptors.  Delineate riparian areas along each by measuring or estimating length and width. Calculators are provided for you elow.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100    100%   100	High   Low   High   High   Low   High   High   Low   High   Hig		with > 60% tree car non-maintained und	nopy cover and an derstory. Wetlands	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense	Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained	Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparselly vegetated non-maintained area, recently seeded and stabilized, or other comparable condition	Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable	ballast. The flows through culvert und Goodes Ro	ne stream ugh a der
Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the lescriptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  Right Bank	Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  3. Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank				High	Low	High		High	Low		
Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the socriptors.  Determine square footage for each by measuring or estimating length and width. Calculators are provided for you alow.  Enter the % Riparian Area and Score for each riparian category in the blocks below.  Blocks equal 100  Blocks equal 100  CI= (Sum % RA * Scores*0.01)/2  Left Bank  % Riparian Area 100%  Score > 0.5  REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	Delimeter typation areas along each stream bank into Condition Categories and Condition Scores using the secretory of the Sec		1.5	5	1.2	1.1	0.85	0.75	0.6	0.5		
Left Bank    We Riparian Area   100%   Rt Bank Cl   0.50	Left Bank    Score >   0.85	elow. Enter the % F	Riparian Area and	Score for each r		·	·	ovided for you		equal 100		
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  OTE: The Cis and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	Lit Bank Ci>   0.85			40001						40001		
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  TE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCl) >>  RCl= (Riparian Cl)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCl X LF X IF	REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF  SERT PHOTOS:	₋eft Bank	· ·							100%		
THE REACH CONDITION INDEX (RCI) >>  RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	THE TEXT PHOTOS:  THE REACH CONDITION INDEX (RCI) >> RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF  SERT PHOTOS:				ONDITION II	NDFX and S	TREAM CO	NDITION LIN	ITC FOR TH	IC DE ACH		
RCI= (Riparian CI)/2  COMPENSATION REQUIREMENT (CR) >>  CR = RCI X LF X IF	RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF	TE: The Cls and F							III S FUR I F	IS REACH		
CR = RCI X LF X IF	ISERT PHOTOS:  CR = RCI X LF X IF		CI should be rounded t	to 2 decimal places.				NDITION ON	IIIS FUR IN		CONDITION IND	DEX (RCI) >>
	ISERT PHOTOS:		CI should be rounded t	to 2 decimal places.				NDITION ON	IIIS FOR IN	THE REACH (		` ,
	ESCRIBE PROPOSED IMPACT:	ISERT PHO		to 2 decimal places.				-		THE REACH O	CI= (Riparian CI ON REQUIREM	)/2

Project/Site: DC2RVA - Area 06

NC DWQ Stream Identification Form Version 4.11

Date: 09/13/2016

06-STR-S-04

Latitude:

Absent 0 0	mation (circle one) ermittent Perennial  Weak	Other e.g. Quad Name:  Moderate	Strong
Absent 0 0	Weak	e.g. Quad Name:  Moderate	
Absent 0 0	Weak	e.g. Quad Name:  Moderate	
Absent 0 0 0	Weak	Moderate	
0 0	1		Strong
0	· ·	2	
0	1)		3
		2	3
<u> </u>	1	2	3
	1	2	3
	1	2	3
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$\rightarrow$			3
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110		163 -	- 0
	1	2	3
	1	2	3
	1		0
0	0.5	1	1.5
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No			
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3			0
		_	3
			3
			1.5
			1.5
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		I = 1.5 Other – C	
nods See n 35 of manus		L = 1.0 Diller = 0	
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nemeral channel			
)	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 0.5 0 0.	O

# Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

	For use in ephemeral streams								
Project #	Project Name	е	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Area	06	VA	R6	02080206	3/15/2016			
Name(s) of Evaluator(s) Stream Nam			e and Informa	ation					

06-STR-S-05

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		Con	ditional Cate	gory				NOTES>>		
	Optimal	Subo	ptimal	Mar	ginal	Po	oor	Field Shee	et: 17-B-	
Riparian Buffers	Tree stratum (dbh > 3 inches) present with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.	arios, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	STR-05.		
		High	Low	High	Low	High	Low			
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5			
Delineate ripa descriptors.	arian areas along each stream ban	k into Condition C	ategories and Co	ondition Scores us	sing the	Ensure	the sums			
	uare footage for each by measuring	ng or estimating le	ngth and width. (	Calculators are pr	ovided for you	of % F	Riparian			
3. Enter the % F	Riparian Area and Score for each r	iparian category i	n the blocks below	v.		Blocks 6	equal 100			
Right Bank	% Riparian Area> 60%	15%	25%				100%			
Tagair Dank	Score > <b>0.75</b>	0.6	0.5							
								CI= (Sum % RA * \$	Scores*0.01)/2	
Left Bank	% Riparian Area> 50%	10%	40%				100%	Rt Bank CI >	0.67	С
	Score > <b>0.75</b>	0.6	0.5					Lt Bank CI >	0.64	0.6

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >> 0.33 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:

J. Budnik & K. Astroth



NC DWQ Stream Identification Form Version 4.11

06-STR-S-05

Date: 3/15/2016	Project/Site: DC2RVA - Area 06	<b>Latitude:</b> 37.489590
Evaluator: J. Budnik, K. Astroth	County: City of Richmond	Longitude: -77.428626
<b>Total Points:</b> 18 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 7	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step ripple-pool sequence	o-pool,	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	$\Theta$	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0		2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel		0 = 0	Yes:	= 3
a artificial ditches are not rated; see discussion	s in manual			
B. Hydrology (Subtotal = $4.5$	_)			
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water tab	le?	0 = 0	Yes:	= 3
C. Biology (Subtotal = $6.5$				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abund	ance) 0	Œ	2	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5	11	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified usir	ng other methods. See p. 35 of manua	al.		
Notes: Some water flow due to recent	t rain events. Stream flows into	o WTL-04. Field	Sheet: 17-B-STR-0	)5.
7		7		
Sketch:	ballast			
WTL//	dense herb layer			
09//	deliae nelb layel		_ /	FLOW
	dense herb laye	er / hillslope		IFLOW
	I-95			

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia in ephemeral streams Cowardin Impact/SAR Impact SAR# Project # **Project Name** Locality HUC Date Class. length Factor N/A DC2RVA - Area 06 ۷A R6 02080206 3/15/2016 Name(s) of Evaluator(s) Stream Name and Information 06-STR-S-06 J. Budnik & K. Astroth 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable **Conditional Category** NOTES>> Optimal Field Sheet: 17-B-High Poor: ow Suboptimal Riparian areas ow Marginal: Non maintained, dense STR-04. ligh Suboptima Riparian areas High Marginal Low Poor: and maintained with tree stratum Non-maintained herbaceous with tree stratum areas, nurseries Impervious (dbh > 3 inches) present, with >30% tree canopy vegetation, riparian areas lacking shrub nd tree stratum, ha ense herbaceou (dbh > 3 inches) no-till cropland; surfaces, mine vegetation with either a shrub resent, with 30% to 60% tree actively grazed Riparian with > 60% tree canopy cover pasture, sparsely enuded surface cover and a layer or a tree production, ponds Buffers canopy cover and containing both herbaceous and row crops, active feed lots, trails, o other comparable vegetated non-maintained area aintained understory. Wetlands layer (dbh > 3 inches) present, with <30% tree open water. If resent, tree stratu (dbh >3 inches) maintained recently seeded Recent cutove shrub layers or a and stabilized, or conditions. (dense canopy cover. present, with <30% other comparable condition. non-maintained egetation). tree canopy cover with maintained understory. understory. Low High High Low High Low Condition 0.85 0.75 0.6 0.5 1.1 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the Ensure the sums escriptors. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 40% 25% 20% 15% 100% Right Bank 0.75 0.85 0.5 Score > 0.6 CI= (Sum % RA \* Scores\*0.01)/2 40% 25% 20% 15% 100% Rt Bank CI > CI 0.67 % Riparian Area>

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

0.5

0.85

THE REACH CONDITION INDEX (RCI) >> 0.34

RCI= (Riparian CI)/2

Lt Bank CI >

0.67

0.67

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

INSERT PHOTOS:

Left Bank



Top Left: Typical view of stream Top Right: Typical view upsteam

0.6

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

0.75

Bottom Left: Typical view of stream toward railroad Bottom Right: Typical view of stream

Project/Site: DC2RVA - Area 06

NC DWQ Stream Identification Form Version 4.11

Date: 3/15/2016

06-STR-S-06

Latitude: 37.497389

Evaluator: J. Budnik, K. Astroth	County: City of	Richmond	Longitude: -77.429553		
<b>Fotal Points:</b> 16 Stream is at least intermittent		nation (circle one) rmittent Perennial	Other e.g. Quad Name:		
f ≥ 19 or perennial if ≥ 30*	Ephemeral inte	Tillittent Pereninai	e.g. Quad Name.		
A. Geomorphology (Subtotal = 5)	Absent	Weak	Moderate	Strong	
<sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3	
2. Sinuosity of channel along thalweg	0	1	2	3	
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
I. Particle size of stream substrate	0	(1)	2	3	
5. Active/relict floodplain	0	Y	2	3	
6. Depositional bars or benches	(0)	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
B. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
0. Natural valley	0	0.5	1	1.5	
Second or greater order channel	No	0 = 0	Yes :	= 3	
artificial ditches are not rated; see discussions in manual					
3. Hydrology (Subtotal = 6 )					
2. Presence of Baseflow	0	1	(2)	3	
3. Iron oxidizing bacteria	0	1)	2	3	
4. Leaf litter	1.5	(1)	0.5	0	
5. Sediment on plants or debris	0	0.5	1	1.5	
6. Organic debris lines or piles	0	0.5		1.5	
7. Soil-based evidence of high water table?	No	0 = 0	Yes :	= 3	
C. Biology (Subtotal = 5					
8. Fibrous roots in streambed	3	2	(1)	0	
9. Rooted upland plants in streambed	(3)	2	1	0	
20. Macrobenthos (note diversity and abundance)	(2)	1	2	3	
21. Aquatic Mollusks	(0)	1	2	3	
22. Fish	8	0.5	1	1.5	
23. Crayfish	0	0.5	(1)	1.5	
24. Amphibians		0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OBI	L = 1.5 Other = 0		
*perennial streams may also be identified using other method:	s. See p. 35 of manua	l.			
Notes: Originates from culvert that runs under railr	oad. Sandy subst	rate, low banks/pod	orly defined char	nel. Collects	
stormwater runoff. Field Sheet: 17-B-STR-0	04.				
Pipeline Row From Plant Force	see into	ground Ango	I-95		

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
Project #		Project Name		wadeable chan	nels classified a Cowardin	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact	
N/A		2RVA - Area		VA	Class.		3/15/2016	JAN#	length	Factor	
	e(s) of Evaluat			e and Informa	R4SB3	02080206	3/13/2016				
	nik & K. A	. ,				ΓR-S-07	(Goode	Creek)			
Channel C	Condition: Asse	ess the cross-sec	tion of the stream		ondition (erosion,	aggradation)		,			
	Opti	mal	Subo	ptimal c	Conditional Catego Mar	ry ginal	Po	or	Sev	ere	
	To the second	مويد المولان	Slightly incircul for	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally u		1		
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-11 Stable point bars/l are present. Acce floodplain or fully bankfull benches. and transverse ba sediment depositio	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60-Depositional feat stability. The bar channels are wellikely has access to or newly develope portions of the r	acas in acure ted banks. Majority table (60-80%). tion or natural rock 80%) AND/OR ures contribute to kifull and low flow Il defined. Stream to bankfull benches, d floodplains along each. Transient s 10-40% of the	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositiv stability, may be	wer bank slopes. esent on 40-60% of lative protection on Streambanks may ercut. AND/OR 40- n is covered by different may be signt, contribute on that contribute forming/present. ed channels have	widen further. Major are near vertical. E 60-80% of bank protection preser banks, and is insul erosion. AND/OF stream is covere Sediment is tempi nature, and contrib AND/OR V-shape vegetative protectic	prity of both banks rosion present on its. Vegetative int on 20-40% of fficient to prevent to 60-80% of the d by sediment. orary/transient in uting to instability. d channels have	Deeply incised vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pred Obvious bank sl. Erosion/raw ban AND/OR Aggradin; than 80% of stream	stability. Severe tained within the ad below average apority of banks ut. Vegetative on less than 20% of eventing erosion. Dughing present. ks on 80-100%. g channel. Greater	
	10% of I	bottom.		bottom.	vegetative protecti banks and depositi	on on > 40% of the onal features which to stability.	40% of the ban sediment depos	ks and stable	deposition, contrib Multiple thread of subterran	uting to instability. channels and/or	CI
Score	3	3	2	.4	:	2	1.	6	1	l	2.0
NOTES>>			Kip-rap p	laced for b	ank protec	tion. Field	Sileet. 14-D	-STR-03.			
	N BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (roi						
	N BUFFERS: A		c's 100 foot riparia		e entire SAR. (roo			h may be accep	NOTES>>	right hank	
	Opti  Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, unopy cover and a derstory. Wetlands	C's 100 foot riparia  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep	NOTES>> I-95 along i Railroad ar along L ba	nd ballast	
RIPARIAN Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the	mal 3 inches) present, nopy cover and a derstory. Wellands e riparian areas.	C's 100 foot ripariat  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> I-95 along i Railroad ar along L ba	nd ballast	
Riparian Buffers  Condition Scores Delineate rips	Opti  Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a letristry. Weltands e riparian areas.	C's 100 foot riparia:  Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2	an areas along the ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> I-95 along i Railroad ar along L ba	nd ballast	
Riparian Buffers  Condition Scores  Delineate ripascriptors. Determine scolow.	Tree stratum (dbh > with > 60% tree cannon-maintained unclocated within the	mal  3 inches) present, nopy cover and a lerstory. Wetlands e riparian areas.	Con Subor Con Subor Con Subor Con Subor Con Subor Con Subor Con Con Con Con Con Con Con Con Con Con	can areas along the ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dength and width and width. (dength and width and width. (dength and width	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, necently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> I-95 along i Railroad ar along L ba	nd ballast	
Riparian Buffers  Condition Scores Delineate ripsescriptors. Determine scelow. Enter the % F	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the	mal  3 inches) present, nopy cover and a lerstory. Wetlands e riparian areas.	Con Subor Con Subor Con Subor Con Subor Con Subor Con Subor Con Con Con Con Con Con Con Con Con Con	can areas along the ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (dength and width and width. (dength and width and width. (dength and width	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr of % Ri	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> I-95 along I Railroad ar along L ba	nd ballast nk.	
Riparian Buffers  Condition Scores Delineate ripa secriptors. Determine scelow. Enter the % F	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the located with	mal  3 inches) present, nopy cover and a terstory. Wetlands e riparian areas.  5  ach stream ban ach by measurin Score for each ri 25%	Con Subor Con Subor Con Subor Con Subor Con Subor Con Subor Con Con Con Con Con Con Con Con Con Con	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutvoer (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tr of % Ri	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>> I-95 along i Railroad ar along L ba	nd ballast nk.	CI
Riparian Buffers  Condition Scores  Delineate rip escriptors. Determine scelow. Enter the % F Right Bank	Tree stratum (dbh > with > 60% tree ca canon-maintained unc located within the located wi	mal  3 inches) present, nopy cover and a letrstory. Wellands eriparian areas.  5  ach stream ban ach by measurin 25% 0.75  30% 0.75	Cs 100 foot riparia:  Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 25% 0.85	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low 1.1  Lategories and Co ngth and width. ( n the blocks below 50% 0.5	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, nurseries; conditized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks ec	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%	NOTES>> I-95 along I Railroad ar along L bar	nd ballast nk.	CI 0.67
Riparian Buffers  Condition Scores Delineate rips Secriptors. Determine scolow. Enter the % fi Right Bank  Left Bank	Tree stratum (dbh > with > 60% tree canon-maintained uncolocated within the located withi	mal  3 inches) present, inopy cover and a derstory. Wetlands er iparian areas.  5  ach by measurin  25%  0.75  30%  0.75  aried substrate si	Cs 100 foot ripariat  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in 25%  0.85  35% 0.85	an areas along the ditional Categories and Congth and width. Congt	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, nurseries; conditized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks ec	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Le sums parian qual 100 100%	NOTES>> I-95 along I Railroad ar along L bar  Cl= (Sum % RA * S Rt Bank Cl >	nd ballast nk.	
Riparian Buffers  Condition Scores  Delineate ripascriptors. Determine scolow. Enter the % if Right Bank  Left Bank  INSTREAI	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	mal  3 inches) present, nopy cover and a ferstory. Wetlands er iparian areas.  5  sach stream ban ach by measurin  25%  0.75  30%  0.75  aried substrate siffle poole comple	Con Subo Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 25% 0.85	to a reas along the ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. (and the blocks below 0.5  35% 0.5  y and depths; wores.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided to the condition of the condition	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks ed.	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 1005  Low 1009  1019%	NOTES>> I-95 along I Railroad ar along L bar  Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl>	nd ballast nk.	
Riparian Buffers  Condition Scores Delineate rips esscriptors. Determine scelow. Enter the % F Right Bank  Left Bank Left Bank INSTREAI ndercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	mal  3 inches) present, nopy cover and a dependence of the search stream ban ach by measurin  Score for each ri  25%  0.75  30%  0.75  aried substrate siffle poole comple	Cs 100 foot riparia:  Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category it 25% 0.85  35% 0.85  Zes, water velocit exes, stable featur  Subo Stable habitat elei	an areas along the ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. (an the blocks below 0.5  y and depths; wo res.  Conditional ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks economic seeds and stabilized of the seeds and stabilized of the seeds and stabilized of the seeds and stabilized of the seeds and stabilized of the seeds and stabilized of the seeds and stabilized of the seeds and stabilized of the seeds are seeds and stabilized of the seeds and seeds are seeds and seeds and seeds are seeds and seeds and seeds and seeds are seeds and seeds and seeds and seeds and seeds are seeds and seeds	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Low 100%  101%  101%	NOTES>> I-95 along I Railroad ar along L bar  Cl= (Sum % RA*S Rt Bank Cl> Lt Bank Cl>	nd ballast nk.	
Riparian Buffers  Condition Scores Delineate ripe Secriptors. Determine scelow. Enter the % f Right Bank  Left Bank  INSTREAL Instream	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	mal  3 inches) present, nopy cover and a ferstory. Wetlands er riparian areas.  5  5  5  5  6  6  6  7  7  8  7  8  7  8  7  8  8  8  8  8	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 25% 0.85  35% 0.85  zes, water velocit exes, stable featur Subo Stable habitat ele present in 30-50% are adequate fo	an areas along the ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 50% 0.5  35% 0.5  by and depths; wores.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided at Category  Mar.  Stable habitat ele present in 10-30% are adequate for are sequented to the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	ts of length & widt  Poor  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % Right Blocks educate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lols, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  101%  101%	NOTES>> I-95 along I Railroad ar along L bai  Cl= (Sum % RA * S Rt Bank Cl> Lt Bank Cl>	nd ballast nk.	

	St	ream In	npact A	ssessm	ent Fo	rm Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	csx		VA	R4SB3	02080206	3/15/2016	06STR-S07		
	ALTERATION: Stream cross poil piles, constrictions, livestock	LTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, piles, constrictions, livestock  Conditional Category  NOTES>>							ailroad and
	Negligible	Mir	Minor		erate	Sev	rere	I-95.	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed	y of the channel in the parameter OR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0.	.5	]	

#### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Typical view downstream Top Right: Typical view downstream Bottom Left: Typical view downstream Bottom Right: Culvert 15, view upstream

NC DWO Stream Identification Form Version 4.11 Goode Creek 06-STR-S-07

110 B 11 Q Stream Identification I of the version 4.11					
Date: 3/15/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.494031			
Evaluator: J. Budnik, K. Astroth	County: City of Richmond	Longitude: -77.432038			
<b>Total Points:</b> 37.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:			

Absent	Weak	Moderate	Strong
0	1	2	3
0	1	(2)	3
0	1	2	3
0	1	(2)	3
0	(1)	2	3
0	1	(2)	3
0	1	(2)	3
0	(1)	2	3
0	0.5		1.5
0	0.5	1	1.5
No	= 0	Yes =	= 3
0	1	2	3
0	(1)	2	3
1.5	1	0.5	0
0	0.5	1	1.5
0	0.5		1.5
No	= 0	Yes =	= 3
3	(2)	1	0
(3)	2	1	0
0	1	2	3
0	(1)	2	3
0	0.5	1	1.5
0	0.5		1.5
0	0.5		1.5
0	0.5	1	1.5
	FACW = 0.75;	OBL = 1.5 Other = 0	
•			
, runs parallel.	Field Sheet: 17-	B-STR-03.	
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 0 1 0 0.5 0 0.5 No = 0	0 1 2 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 0

		Stre			sment Methodology f		) (For	m 1)			
			For use in	wadeable chan	nels classified a	s intermittent or	perennial		1/045		
Project #		Project Name	•	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	2RVA - Area	06	VA	R2SB3	02080206	3/15/2016				
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa			•		<u>'</u>		
J. Bud	dnik & K. A	stroth			06-S	TR-S-08	Goode	Creek)			
1. Channel C	Condition: Asse	ess the cross-sec	ction of the stream	and prevailing c	ondition (erosion,	aggradation)					
	Opt	Optimal Subor		ptimal		ginal	Po	or	Sev	vere .	
	Very little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than sediment deposition covers less than		1			less than Severe or	Overwidend		1	5	
Channel Condition			cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along each. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositiv stability, may be	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maji are near vertical. E 60-80% of banl protection presei banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrik AND/OR V-shape	ority of both banks crosion present on ks. Vegetative to 10-40% of fficient to prevent R 60-80% of the ad by sediment. orary/transient in outing to instability. ad channels have	Deeply incised vertical/lateral in incision, flow cor banks. Streambrooting depth, n vertical/underc protection present obanks, is not pre Obvious bank sl Erosion/raw bar	on less than 20% of eventing erosion. oughing present. else on 80-100%.		
	10% of	bottom.	stream	s 10-40% of the bottom.	vegetative protecti banks and depositi contribute	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection is present on > 40% of the banks and stable		than 80% of stream deposition, contrib Multiple thread subterrar	channels and/or nean flow.	
Score	3	3	2	.4	]	2	1.	.6		l	- 2
2. RIPARIAI			Con	ditional Cate	e entire SAR. (rough measurements of length						
Riparian Buffers	with > 60% tree ca	> 3 inches) present, anopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		_	
0 1545			High	Low	High	Low	High	Low			
Condition Scores	1.	.5	1.2	1.1	0.85	0.75	0.6	0.5			
descriptors. 2. Determine so below.	quare footage for e Riparian Area and % Riparian Area> Score >	each by measurin	g or estimating le	ngth and width. (	Calculators are pr		Ensure the of % R	iparian			
	1								CI= (Sum % RA * S	cores*0.01)/2	
Left Bank	% Riparian Area>	80%	20%					100%	Rt Bank CI >	0.68	
3. INSTREAL	Score >				ody and leafy deb	oris; stable substr	ate; low embeded	ness; shade;	Lt Bank CI >	1.05	0
undercut banks; Instream	; root mats; SAV; r		•	Conditiona		ninal	P-	or			
Hab!t-t/	Opt	imal		ptimal ments are typically		ginal ments are typically	Po Habitat elements				
Habitat/ Available		re typically present	present in 30-50%	6 of the reach and	present in 10-30%		lacking or are ur				
	Habitat elements a in greater than 5	0% of the reach.	present in 30-50% are adequate fo popul		are adequate fo popul	% of the reach and r maintenance of ations.	lacking or are ur elements are typica than 10% of	ally present in less f the reach.	-		1

	St	ream In	npact A	ssessm	ent Fo	m Pag	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	csx		VA	R2SB3	02080206	3/15/2016	06STR-S08		
	L ALTERATION: Stream cross poil piles, constrictions, livestock	sings, riprap, conc	rete, gabions, or		straightening of cl	hannel, channeliz	zation,	NOTES>>	
	Negligible	Mi	nor	Mode	erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	in the parameter OR 80% of banks abion, riprap, or		
								J	

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Typical view of stream
Top Right: View upstream at Culvert 19
Bottom Left: View upstream at Culvert 17
Bottom Right: View of Culvert 20

NC DWQ Stream Identification Form Version 4.11 Goode Creek 06-STR-S-08

Date: 3/15/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.486998
Evaluator: J. Budnik, K. Astroth	County: City of Richmond	Longitude: -77.43727
Total Points: 36 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 16.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1_	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence	U	· · · · · · · · · · · · · · · · · · ·		
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	<u> </u>	2	3
6. Depositional bars or benches	0	$\Box$	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	<u> </u>	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual			<u> </u>	
B. Hydrology (Subtotal = $8$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	(No	0 = 0	Yes:	= 3
C. Biology (Subtotal = <u>11.5</u> )				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other metho	ds. See p. 35 of manua	l.		
Notes: Goode Creek. Field Sheet: 17-B-STR-08				
Sketch:	mboo Forest			
CROIGH.		2	and the	
- U.S. 12 12 12 12 12 12 12 12 12 12 12 12 12			3	
Pipeline/Po	werline ROV	/	_	
ballas	1			
1111111111			1	
,	- Janes Janes J	- Andrews		

N/A DC2RVA - Area 06 VA R2SB3 02880206 3/15/2016  Name(s) of Evaluator(s)  J. Budnik & K. Astroth  1. Channel Condition: Assess the cross-section of the sitesm and prevailing condition (excess). Bud less than Sover or Perc. Busine more suche than Sover or Perc. Busine more suche than Sover or Perc. Busine more such than Sover or Perc. Business from			Strea	Uni	fied Stream M	/lethodology f	or use in Virg		m 1)			
N/A DC2RVA - Area 06 VA R2SB3 02080206 3/15/2016  Name(s) of Evaluator(s) Stream Name and Information  J. Budnik & K. Astroth  O6-STR-S-09  1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)  Conditional Category  Very little incidence or action encores, 80 (10%) significant leaves to the condition or action encores, 80 (10%) significant leaves to the condition or action encores, 80 (10%) significant leaves to the condition or action encores, 80 (10%) significant leaves to the condition or action encores, 80 (10%) significant leaves to the condition or action encores, 80 (10%) significant leaves to the condition or action encores, 80 (10%) significant leaves to the condition of the condition or action encores, 80 (10%) significant leaves to the condition or action encores, 80 (10%) significant leaves to the condition or action encores, 80 (10%) significant leaves to the condition or action encores, 80 (10%) significant leaves to the condition or action encores, 80 (10%) significant leaves to the condition or action encores, 80 (10%) significant leaves to the condition or action encores, 80 (10%) significant leaves to the condition or action encores, 80 (10%) significant leaves to the condition or action encores, 80 (10%) significant leaves to the condition or action encores, 80 (10%) significant leaves to the condition of the condition or action encores, 80 (10%) significant leaves to the condition or action encores, 80 (10%) significant leaves to the condition of the co	Project #	Proj	ect Name	For use in		Cowardin			SAR#		Impact Factor	
J. Budnik & K. Astroth  Channel Condition: Assess the cross-section of the stream and prevailing condition (receious, appression)  Condition Channel Condition Channel Condition	N/A	DC2RV	/A - Area 06	 S	VA		02080206	3/15/2016		lengin	racioi	
Channel Condition: Assess the cross-action of the stream and prevailing condition (eresion, aggradation) Condition Channel Condition Channel Condition Channel Condition Channel Condition	Name	e(s) of Evaluator(s	s) Stı	tream Nam	e and Inform	ation						
Optimal Suboptimal Wary justs nation or active excess. 16 Condition Surface protection or natural cost promisent (60-100), ABOPR Subles protection or natural rock promisent (60-100), ABOPR Subject or for a first protection or natural rock promisent (60-100), ABOPR Subject or for a first protection or natural rock promisent (60-100), ABOPR Subject or for a first protection or natural rock promisent (60-100), ABOPR Subject or for a first protection or natural rock promisent (60-100), ABOPR Subject or for a first protection or natural rock promisent (60-100), ABOPR Subject or for a first protection or natural rock protection or for a first protection or for a fir	J. Bu	dnik & K. Astrot	th				06-ST	R-S-09				
Channel Condition Channel Condition Channel Condition Channel Condition Channel Condition Channel Condition Condition Channel Condition Condition Channel Condition Co	. Channel C	ondition: Assess the	e cross-section	of the stream								
Channel Condition  Channel Condi		Optimal		Subo				Po	or	Sev	ere	
Channel Condition  Wey little incidence rather entoins, the special protection or natural row, dependence on the protection or natural row, beginning the protection or natural row, dependence on the protection or natural row, dependence on the protection or natural row, dependence on the protection or natural row, dependence on the protection or natural row, dependence on the protection or natural row, dependence on the protection or natural row, dependence on the protection or natural row, dependence on the protection or natural row, dependence on the protection or natural row, dependence on the protection or natural row, dependence on the protection or natural row, dependence on the protection or natural row, dependence on the protection or natural row, dependence on the protection or natural row, dependence on the protection or natural row, dependence on the protection or natural row, dependence on the protection or natural row, dependence on the protection or natural row, dependence on the protection or present or near the protection or pre		Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and traceptors have five. Traceptors.		1						1	5	
sediment deposition covers less than 10% of bottom.  AAD/OR V-shaped chaminels have spetative protection on > 4% or 40% of the banks and dabble sediment deposition is absent.  AAD/OR V-shaped chaminels have spetative protection on > 4% or 40% of the banks and stable sediment deposition is absent.  AAD/OR V-shaped chaminels have spetative protection on > 4% or 40% of the banks and stable sediment deposition is absent.  AAD/OR V-shaped chaminels have spetative protection on > 4% or 40% of the banks and stable sediment deposition is absent.  AAD/OR V-shaped chaminels have spetative protection on > 4% or 40% of the banks and stable sediment deposition is absent.  AAD/OR V-shaped chaminels have spetative protection on > 4% or 40% of the banks and stable sediment deposition is absent.  AAD/OR V-shaped chaminels have been stable when the stable is a stable sediment deposition is absent.  AAD/OR V-shaped chaminels have been stable when the spetative protection on > 4% or 40% of the banks and stable sediment deposition is absent.  AAD/OR V-shaped chaminels have been stable when the stable is and deposition on the stable when the said of the banks and deposition on the stable sediment deposition is absent.  AAD/OR V-shaped chaminels have been stable when the said is and deposition on the said of the banks and deposition on the said of the banks and deposition on the said of the banks and deposition of the banks and deposition of the banks and deposition of the banks and deposition of the banks and deposition of the banks and deposition of the banks and deposition of the banks and deposition of the banks and deposition of the banks and deposition of the banks and deposition of the banks and deposition of the banks and deposition of the banks and deposition of the banks and the banks and deposition of the banks and deposition of the banks and deposition of the banks and deposition of the banks and the banks and deposition of the banks and deposition of the banks and deposition of the banks and deposition of the banks and d				or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by discovered by discovered by discovered by discovered to that contribute on that contribute to the significant of th	widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/OI stream is cover Sediment is temp nature, and contril	ority of both banks Frosion present on ks. Vegetative nt on 20-40% of ifficient to prevent R 60-80% of the ed by sediment. porary/transient in puting to instability.	vertical/lateral in incision, flow cor banks. Streambe rooting depth, m vertical/underc protection present obanks, is not pre Obvious bank sle Erosion/raw ban	stability. Severe tatained within the ad below average najority of banks but. Vegetative on less than 20% of eventing erosion. Deughing present. liks on 80-100%.			
Riparian   Buffers   Poor   Conditional Category   Conditional Cat			and transverse bars few. Transient ediment deposition covers less than 10% of bottom.  portions of the reach. Transient sediment covers 10-40% of the stream bottom.  stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which		vegetative protecti 40% of the bar	on is present on >	than 80% of stream deposition, contrib Multiple thread	bed is covered by outing to instability. channels and/or	С			
Conditional Category	Score	3		2	2.4		2	1.	.6	1	I	2.4
Riparian areas with tree stratum (dth > 3 inches) present, with 30% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.  High Suboptimal: Riparian areas with tree stratum (dth > 3 inches) present, with 30% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.  High Suboptimal: Riparian areas with tree stratum (dth > 3 inches) present, with 30% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High Low High Low High Low High Low other canopy cover with maintained understory.  High Low High Low High Low High Low other comparable condition.  Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the essential conditions.  Scores 0.0.85 0.75 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.	. RIPARIAN		s both bank's 10	Con	nditional Cate	gory						
Condition Scores  1.5  1.2  1.1  0.85  0.75  0.6  0.5  1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors. 2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below. 3. Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank  % Riparian Area> 60% 20% 20% Blocks equal 100  Cl= (Sum % RA * Scores*0.0 Rt Bank Cl > 0)  Right Bank  % Riparian Area> 60% 20% 20% Riparian Area> 00% Riparian Area> 00% Riparian Ri		Tree stratum (dbh > 3 incl with > 60% tree canopy non-maintained understor	hes) present, cover and a ry. Wetlands ian areas.	gh Suboptimal: kiparian areas ith tree stratum ibh > 3 inches) esent, with 30% to 60% tree nopy cover and ontaining both ended to the country includes a contraining to the and the country includes a contraining to the cont	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Scores 1.5 1.2 1.1 0.85 0.75 0.6 0.5  1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  3. Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank  % Riparian Area> 60% 20% 20% 100%  Score > 0.85 0.75 0.5  Cl= (Sum % RA * Scores*0.0 100%  Rt Bank Cl > 0				High	Low	High	Low	High	Low			
descriptors.  2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.  3. Enter the % Riparian Area and Score for each riparian category in the blocks below.  Right Bank  % Riparian Area> 60% 20% 20% 100%  Score > 0.85 0.75 0.5  Cl= (Sum % RA * Scores*0.0*)  Left Bank  % Riparian Area> 60% 20% 20% 100%  RR Bank Cl > 0.5		1.5		1.2	1.1	0.85	0.75	0.6	0.5			
Score > 0.85   0.75   0.5	escriptors.  Determine squelow.	uare footage for each b	y measuring or	r estimating le	ength and width.	Calculators are pr	•	of % Riparian				
Cl= (Sum % RA * Scores*0.0   Cl= (Sum % RA	Right Bank								100%	_		
left Bank										· ·		
Et Bailk 01 2									100%		0.76 0.76	0.7
3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embeddeness; shade;	Left Bank		substrate sizes,	, water veloci	ty and depths; wo	oody and leafy deb	oris; stable substr	ate; low embeded	Iness; shade;		5.70	0.7
undercut banks; root mats; SAV; riffle poole complexes, stable features.  Conditional Category	. INSTREAM		ooie complexes	s, stabie lediu		al Category						
Habitat/  Stable habitat elements are typically   Stable habitat elements are typically   Habitat elements isted above are	. INSTREAM ndercut banks;						ainal	Do.	or	l		
Available Habitat elements are typically present present in 30-50% of the reach and in greater than 50% of the reach. are adequate for maintenance of elements are typically present in less	. INSTREAM ndercut banks; Instream Habitat/	root mats; SAV; riffle po	Sts		•							
populations.         populations.         than 10% of the reach.           Score         1.5         1.2         0.9         0.5	. INSTREAM ndercut banks; Instream Habitat/ Available	Optimal Habitat elements are typic	cally present pre	table habitat ele resent in 30-509 are adequate fo	ements are typically % of the reach and or maintenance of	Stable habitat ele present in 10-30% are adequate fo	ments are typically % of the reach and or maintenance of	Habitat elements lacking or are un elements are typic	listed above are estable. Habitat ally present in less	-		CI

B. C. C. B. C. C. C. C. C. C. C. C. C. C. C. C. C.
Project # Applicant Locality Cowardin Class. HUC Date Data Point SAR length Impact F
N/A CSX VA R2SB3 02080206 3/15/2016 06STR-S09
CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization,  MOTES>>  Rip-rap placed fo
Conditional Category
Negligible Minor Moderate Severe Stabilization, Crea
Channel Alteration  Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization or hardening absent. Stream has an unaltered pattern or has naturalized.  Channelization, dredging, alteration, or hardening absent. Stream has bean unaltered pattern or has naturalized.  Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.  Channelization, dredging, alteration, or hardening absent. Stream has a bean channelized, normal stable stream meander pattern has not recovered.  Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.
SCORE 1.5 1.3 1.1 0.9 0.7 0.5
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH
REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH  OTE: The Cls and RCl should be rounded to 2 decimal places. The CR should be rounded to a whole number.  THE REACH CONDITION INDEX (RCI

INSERT PHOTOS:





Top Left: View downstream away from railroad Top Right: View downstream away from railroad Bottom Left: View upstream toward culvert under railroad

CR = RCI X LF X IF

NC DWQ Stream Identification Form Version 4.11

06-STR-S-09

Date: 3/15/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.489194
Evaluator: J. Budnik, K. Astroth	County: City of Richmond	Longitude: -77.436744
<b>Total Points:</b> $36.75$ Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitten Perennial	Other e.g. Quad Name:

0			Strong
	1	2	3
0	(1)	2	3
0	1	2	3
0	1	(2)	3
0	1	2	3
0	1	(2)	3
0	1	2	3
0	1	2	3
0	0.5	$\mathbb{C}$	1.5
0	0.5	1	1.5
No	= 0	Yes:	= 3
		_	
0	1	2	(3)
0	1	2	3
1.5	1	0.5	0
0	0.5	1	1.5
0	0.5	6	1.5
No	= 0	Yes :	= 3
3	(2)	1	0
(3)	2	1	0
0	1	2	3
0	(1)	2	3
0	0.5	$\bigcirc$	1.5
0	0.5	1	1.5
0	0.5		1.5
0	0.5		1.5
	EACW = 0.75	OBL = 1.5 Other = 0	)
ee p. 35 of manual			
STR-06.			
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 0 1 0 0 1 0 0.5 0 0.5 0 0.5 No = 0	0 1 2 0 0 0.5 0 0.5 0 0.5 0 0

#### **Ephemeral Stream Assessment Form (Form 1a)** Unified Stream Methodology for use in Virginia For use in ephemeral stre Cowardin Impact HUC SAR # Project # **Project Name** Locality Date Class length Factor N/A DC2RVA - Area 06 ۷A 02080206 3/15/2016 R6 Name(s) of Evaluator(s) Stream Name and Information J. Budnik & K. Astroth 06-STR-S-10 2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable Conditional Category NOTES>> Optimal Marginal Field Sheet: 17-B-Low Marginal: Non-maintained, dense herbaceous regetation, ripariar High Poor: Lawn STR-07. wed, and High Suboptimal Riparian areas wit ree stratum (dbh ow Suboptimal High Marginal: Non-maintained, dense herbaceous maintained areas nurseries; no-till Low Poor: Impervious surfaces, mine Riparian areas with ree stratum (dbh: cropland; actively reas lacking shrul 3 inches) present, with 30% to 60% 3 inches) present, with >30% tree Tree stratum (dbh > 3 inches) present vegetation with and tree stratum. grazed pasture spoil lands. Riparian either a shrub layer or a tree layer (dbh 3 inches) present with <30% tree hay production, conds, open wate If present, tree stratum (dbh >3 with > 60% tree canopy cover and an non-maintained understory. Wetlands parsely vegetate non-maintained enuded surfaces tree canopy cover and containing bot herbaceous and anopy cover and maintained nderstory. Recer row crops, active feed lots, trails, or **Buffers** area, recently other comparable shrub layers or a cutover (dense canopy cover. inches) present abilized, or othe conditions. non-maintained vegetation). with <30% tree canopy cover with maintained understory. comparable condition. understory. High Low High Low High Low Condition 0.85 0.75 0.6 0.5 1.5 1.2 1.1 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian 3. Enter the % Riparian Area and Score for each riparian category in the blocks below Blocks equal 100 % Riparian Area> 10% 60% 70% Right Bank 0.85 0.75 Score > CI= (Sum % RA \* Scores\*0.01)/2

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

40%

0.85

% Riparian Area>

Score >

60%

0.75

THE REACH CONDITION INDEX (RCI) >>

Rt Bank CI >

Lt Bank CI >

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

0.54

0.79

CI

0.66

0.33

0

CR = RCI X LF X IF

100%

INSERT PHOTOS:

Left Bank



Left: Typical view of incised stream bed Right: Typical view of incised stream

Date: 3/15/2016	Project/Site: DC	2RVA - Area 06	Latitude: 37.48	37937	
Evaluator: J. Budnik, K. Astroth	County: City of	Richmond	Longitude: -77.437268  Other e.g. Quad Name:		
<b>Total Points:</b> 17.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*		nation (circle one) ermittent Perennial			
A. Geomorphology (Subtotal = 8)	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3	
Sinuosity of channel along thalweg	0			3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
Particle size of stream substrate	0	1)	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	(0)	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	No	o = 0	Yes :	= 3	
a artificial ditches are not rated; see discussions in manua	al				
B. Hydrology (Subtotal = 5			_		
12. Presence of Baseflow	0	1	(2)	3	
13. Iron oxidizing bacteria	0	(1)	2	3	
14. Leaf litter	1.5	(1)	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	No	0 = 0	Yes :	= 3	
C. Biology (Subtotal = 4.25					
18. Fibrous roots in streambed	3	2	(1)	0	
19. Rooted upland plants in streambed	3	2	$\overline{(1)}$	0	
20. Macrobenthos (note diversity and abundance)		1	2	3	
21. Aquatic Mollusks	(6)	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		ACW = 0.75 OBI	_ = 1.5 Other = 0	)	
*perennial streams may also be identified using other me	ethods. See p. 35 of manua	al.			
Notes: Tributary to Goode Creek. Steep banks	s/erosion (Broad Rock	Creek). Field Shee	et: 17-B-STR-07		
Sketch:  Culvert 16	steep	/incised banks	s / ſ	Cra	
E Culvert 16		The second secon	11	1-000	

		Stre	Uni	fied Stream M	lethodology f	or use in Virg		m 1)			
Project #		Project Name		wadeable chan  Locality	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC	C2RVA - Area	06	VA	R4SB3	02080206	3/15/2016		lengui	Factor	
Nam	e(s) of Evalua	itor(s)	Stream Nam	e and Informa	ation						
J. Bı	ıdnik & K. As	stroth				06-ST	R-S-11				
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal	onditional Catego	<sub>ry</sub> ginal	Po	or	Sev	ere	
	Very little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient protection or natural rock prominent (60-80%) AND/OR bepositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, nor newly developed floodplains along portions of the reach. Transient		1	~	Often incised, but I	less than Severe or	Overwiden	ed/incised.	1	5	
Channel Condition			or Poor due to lo Erosion may be pri both banks. Vegei 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositio stability, may be		widen further. Maj are near vertical. E 60-80% of ban protection prese banks, and is insu erosion. AND/Of stream is covere Sediment is temp nature, and contrit AND/OR V-shape	ority of both banks crosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the dby sediment. orary/transient in outing to instability.	incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank slc Erosion/raw ban AND/OR Aggrading	stability. Severe tained within the d below average lajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%.			
		addiment deposition covers less than addiment deposition covers less than 10% of bottom.  10% of bottom.  10% of bottom.  10% of bottom.  10% of bottom.  10% of bottom.  10% of bottom.  10% of bottom.  10% of bottom.  10% of bottom.  10% of bottom.  10% of bottom.  10% of bottom.  10% of bottom.  10% of bottom.  10% of bottom.  10% of bottom.		AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.				С			
Score	3	3	2	.4		2	1.	6	1		1.0
2 RIPARIAI	N BUFFERS:	Access both bank	's 100 foot rinaria	an areas along the	entire SAR (ro	ugh measuremen	ts of length & wid	h may be accen	table)		
2. RIPARIAI	N BUFFERS: /	Assess both bank	Con	an areas along the ditional Cate ptimal	gory	ugh measuremen	ts of length & wid		notes>>		
2. RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con	ditional Cate	gory						
Riparian Buffers	Opti Tree stratum (dbh ; with > 60% tree cr. non-maintained un	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  .5  each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  > 3 inches) present, anopy cover and a deterstory. Wetlands he riparian areas.  .5  each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 20%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %	Tree stratum (dbh: with > 60% tree cr non-maintained un located within th  1. arian areas along quare footage for e	imal  > 3 inches) present, anopy cover and a deterstory. Wetlands he riparian areas.  .5  each stream ban each by measuring score for each ries and sc	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating leparian category in	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100		cores*0.01)/2	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  .5  each stream ban each by measurin  Score for each ri  80%  0.75	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.5	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5  he sums iparian qual 100	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	0.70	Ci
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the %  Right Bank	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area>	imal  > 3 inches) present, anopy cover and a deterstory. Wetlands he riparian areas.  5  each stream ban each by measurin Score for each ri 80% 0.75	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 20% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	-	CC 0.7
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  .5  each stream ban each by measurin  Score for each ri  80%  0.75  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.5  20% 0.5  zes, water velocii	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provinced to the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	0.70	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  .5  each stream ban each by measurin  Score for each ri  80%  0.75  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.5  20% 0.5  zes, water velocit exes, stable featu	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 10.5  L	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.70	
Condition Scores  Delineate rip descriptors. Enter the % Right Bank  Left Bank  Left Bank  INSTREAl undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree conon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  5  each stream ban each by measurin Score for each ri 80% 0.75  80% 0.75  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.5  20% 0.5  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically % of the reach and	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R  Blocks en  Habitat elements lacking or are ur	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.70	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi; root mats; SAV; r  Opti Habitat elements a in greater than 5	imal  > 3 inches) present, anopy cover and a derstory. Wetlands he riparian areas.  5  each stream ban each by measurin Score for each ri 80% 0.75  80% 0.75  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 20% 0.5  20% 0.5  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-509 are adequate fo popul	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below the blocks below ty and depths; wo res.  Conditional ptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided to the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to f % R Blocks end	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%  100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.70	

Project# N/A . CHANNEL ALT	<b>ा</b>				ant Far	D	- 0			
N/A . CHANNEL ALT		ream In								
. CHANNEL ALT	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
. CHANNEL ALT	CSX  - ALTERATION: Stream crossings, riprap, concr		VA	R4SB3	02080206	3/15/2016	06STR-S11			
mbankments, spoil pile	ERATION: Stream cross es, constrictions, livestock	ings, riprap, conc	rete, gabions, or	concrete blocks, s	straightening of ch	hannel, channeli	zation,	NOTES>> Originates	for	
	Negligible	Mir	Conditiona		erate	Se	vere	culvert. St		
or har unalte	Less than 20% of the stream reach of the stream reach of the stream reach of the channel and unaltered pattern or has naturalized.  Less than 20% of the stream reach of the channel alterations listed in the parameter guidelines.		annelization, dredging, alteration, tardening absent. Stream has an alterations listed in the parameter guidelines. It the parameter guidelines. It the parameter guidelines. It the parameter guidelines. It the parameter guidelines. It the parameter guidelines. It the parameter guidelines. It the parameter guidelines and the parameter guidelines. It stream has been channelized, normal stable stream meander pattern has not recovered.		el er iks		CI			
SCORE	1.5	1.3	1.1	0.9	0.7		.5			0.70
		ONDITION II			NDITION UN	ITS FOR TH		OONDITION IN	SEV (DOI)	
OTE: The CIS and RCI shoul	d be rounded to 2 decimal places. I	The CR should be roun	ded to a whole numbe	er.				CONDITION INI		
							COMPENSAT	ION REQUIREM		0
IOEDT PUSTS							CR = RC	I X LF X IF		Ī
NSERT PHOTOS	<u> </u>			1		2, 5,		of the second	Said To	10000
•	Right: View upstream culvert unde culvert unde om Left: View of conf with field str 17-B-STR-08	r railroad luence eam								

NC DWQ Stream Identification Form Version 4.11

06-STR-S-11

Date: 3/15/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.486270
Evaluator: J. Budnik, K. Astroth	County: City of Richmond	Longitude: -77.437882
<b>Total Points:</b> 25 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

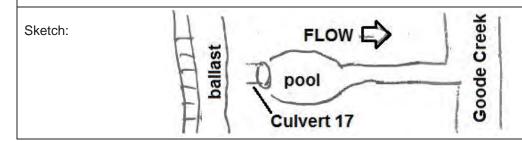
A. Geomorphology (Subtotal = $8.5$	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0		2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manua				
B. Hydrology (Subtotal = $\frac{7.5}{}$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	(1)	0.5	0

B. Hydrology (Gubtotal = 1:0				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	N	lo = 0	Yes:	= 3

C. Biology (Subtotal = $9$				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0		2	3
21. Aquatic Mollusks	0	$\square$	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	E	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; (	OBL = 1.5 Other = 0	

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream originates from Cul-17 that runs under railroad. Tributary to Goode Creek. Field Sheet: 17-B-STR-09.



		Stre		SSESS fied Stream M			i (Fori	m 1)			
				wadeable chan	nels classified a	s intermittent or	perennial		Impact/SAR	Impact	
Project #		Project Name	•	Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A		2RVA - Area		VA	R2SB3	02080206	3/16/2016				
	e(s) of Evalua Idnik & K. As	. ,	Stream Nam	e and Informa	ation	06 STI	R-S-12				
			tion of the atroom	and provoiling o	andition (areaian		K-3-12				
Channel	ondition: Asse			С	Conditional Catego	ry					
	Opti	ımaı	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
		Who was a series of the series	Slightly incised, for	ew areas of active	Poor. Banks more	less than Severe or stable than Severe	Overwidene Vertically/laterally u	unstable. Likely to	Deeply incised	(or excavated).	
Channel Condition	Very little incision of 100% stable bar surface protection prominent (80-1). Stable point bars, are present. Acce floodplain or fully bankfull benches. and transverse be a	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock- -80%) AND/OR tures contribute to hkfull and low flow Il defined. Stream o bankfull benches, id floodplains along reach. Transient	Erosion may be proboth banks. Veget 40-60% of banks. bevertical or unde 60% of stream sediment. Set temporary/tran instability. Depositiv	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Major are near vertical. E 60-80% of banh protection preser banks, and is insurerosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape.	rosion present on ks. Vegetative nt on 20-40% of fficient to prevent 6 60-80% of the d by sediment. orary/transient in outing to instability.	vertical/lateral in incision, flow con banks. Streambe rooting depth, m vertical/underc protection present of banks, is not pre Obvious bank ske Erosion/raw bank	stability. Severe tained within the do below average lajority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%.	
	sediment depositio	on covers less than bottom.	sediment cover	reach. Transient rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the bark sediment depos	on is present on > iks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	.4	:	2	1.	6	1		2.0
				_			4. 44 D CT				
NOTES>>			Trib	outary to Ja	ames River.	. Field Shee	et: 14-6-511	R-10.			
	N BUFFERS: A	Assess both bank		-					otable)		
			c's 100 foot riparia	an areas along the	e entire SAR. (roo	ugh measuremen	ts of length & widt	h may be accep	NOTES>>		
	Opti Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Suborting High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree	an areas along the	e entire SAR. (roo	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with		h may be accep	NOTES>> Dense Jap honeysuck		
. RIPARIAN	Opti  Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	C's 100 foot riparia  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categorium l  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Dense Jap honeysuck		
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Riparian Buffers  Condition Scores  Delineate ripaescriptors. Determine scoelow.	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	imal  - 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  -5  -5  -6  -6  -6  -6  -6  -6  -6  -6	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Dense Jap honeysuck		
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Riparian Buffers  Condition Scores  Delineate ripascriptors. Determine scolow. Enter the % fine store the scolow. Left Bank  INSTREAL	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	imal  3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.  50  each stream ban each by measuring Score for each rough to 100% 0.75  100% 0.75  arried substrate si fifte poole comple	Con Subo Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 50% 0.5	an areas along the ditional Categoretimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (cong	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided to the condition of the condition	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>> Dense Japa honeysuck  Cl= (Sum % RA * S Rt Bank Cl > Lt Bank Cl >	cores*0.01)/2	
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	St	ream In	npact A	ssessm	ent Fo	rm Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX		VA	R2SB3	02080206	3/16/2016	06STR-S12		
	L ALTERATION: Stream cross spoil piles, constrictions, livestock	sings, riprap, conc	rete, gabions, or		straightening of cl	hannel, channeliz	zation,	NOTES>>	
	Negligible	Mir	nor		erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	10% of reach is y of the channel in the parameter DR 80% of banks ubion, riprap, or nent.		
	1.5	1.3	1.1	0.9	0.7	_	.5		

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: Typical view upstream
Top Right: Typical view of stream
Bottom Left: Culvert 22, view downstream
Bottom Right: Typical view of stream

**NC DWQ Stream Identification Form Version 4.11** 

### 06-STR-S-12

Date: 3/16/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.433683
Evaluator: J. Budnik, K. Astroth	County: Chesterfield	Longitude: -77.434278
<b>Total Points:</b> 32.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermitted Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 15)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1		3
ripple-pool sequence	U	ı	(2)	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	<b>(</b> 1)	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1)	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
a artificial ditches are not rated; see discussions in manual	•			
B. Hydrology (Subtotal = 7.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	$\overline{}$	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = 10.25				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		ACW = 0.75	OBL = 1.5 Other = 0	
*perennial streams may also be identified using other metho	ds. See p. 35 of manua			·
Notes: Tributary to James River. Field Sheet: 17-				
Sketch:		3	V V I "	1
1 3 00 3	o steep rip ra	p bank 66 2	-	
D 0 2 0 0 00	000	0 0 0		
6			- NATIONAL PROPERTY AND A	
00000	FLOW	- do-		
Culvert 20 rip rap st	eep bank / Japa	anese honey	suckle	

		Stre				Form	(For	m 1)			
				wadeable chan	nels classified a	s intermittent or	perennial		Impact/SAR	Impact	
Project #		Project Name	•	Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A		2RVA - Area		VA	R2SB3	02080206	9/13/2016				
	e(s) of Evaluat	. ,	Stream Name	e and Informa	ation	OC CT	D C 12				
	taski; R. Maı				nu / 1		R-S-13				
Channel	ondition: Asse			C	Conditional Catego	ry					
	Opti	imal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	1	Who have	Slightly incised fa	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		Deeply incised	(or even unted)	
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	n or natural rock, 00%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The ban channels are wel likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock-80%). AND/OR tures contribute to akfull and low flow II defined. Stream o bankfull benches, d floodplains along reach. Transient	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be isient, contribute on that contribute to forming/present.	widen further. Majo are near vertical. E 60-80% of banl protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrib AND/OR V-shape	rosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in: incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sic Erosion/raw ban	stability. Severe tained within the do below average tajority of banks ut. Vegetative in less than 20% of venting erosion. Sughing present. It is on 80-100%.	
	sediment depositio	on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protection 40% of the bark sediment depos	on is present on > iks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	.4		2	1.	6	1		2.0
NOTES>>				F	ield Sheet	: 17-STR-02	2.				
. RIPARIAN	N BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro	ugh measuremen	ts of length & widt	h may be accep	table)		
. RIPARIAN	N BUFFERS: A	Assess both bank		an areas along the		ugh measuremen	ts of length & widt	h may be accep	table)		
RIPARIA	N BUFFERS: A		Con		gory	ginal	ts of length & widt				
RIPARIAN Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Coni Subop High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation,	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.				
Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree cc non-maintained und located within the	imal  > 3 inches) present, anopy cover and a derstory. Wellands eriparian areas.	Conc Suboy  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">30% tree canopy cover.</a> High	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.			
Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree ca	imal  > 3 inches) present, anopy cover and a derstory. Wellands eriparian areas.	Coni Subop High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active fee lots, trails, or or other comparable conditions.			
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Riparian Buffers  Condition Scores  Delineate rips Secriptors. Determine scolow. Enter the % F	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal  3 inches) present, anopy cover and a derstory. Wellands e riparian areas.  5  each stream ban each by measuring Score for each r 80%	Con- Suboj  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating len parian category in 20%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
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#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor N/A CSX R2SB3 02080206 3/14/2016 06STR-S13 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate A stream flows through a large Negligible Minor Severe corrugated metal 60 - 80% of reach 40 - 60% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in pipe culvert. Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. CI SCORE 1.5 1.3 1.1 0.9 0.7 0.5 1.20 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Stream channel and culvert.

Top Right: Stream channel.

**NC DWQ Stream Identification Form Version 4.11** 

### 06-STR-S-13

Date: 09/13/2016	Project/Site: DC2RVA - Area 06	<b>Latitude:</b> 37.424759
Evaluator: L. Postaski, R. Magnum	County: Chesterfield	Longitude: -77.430430
<b>Total Points:</b> 32 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

of channel bed and bank         0         1         2         3           of channel along thalweg         0         1         2         3           structure: ex. riffle-pool, step-pool, sequence         0         1         2         3           sequence         0         1         2         3           sequence         0         1         2         3           ste of stream substrate         0         1         2         3           at floodplain         0         1         2         3           all bars or benches         0         1         2         3           avail deposits         0         1         2         3           trol         0         1         2         3           trol         0         0.5         1         1.5           alley         0         0.5         1         2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 1 1 1 1 1 0.5 0.5 0.5 = 0	2 2 2 2 1 1 1 Yes =	3 3 3 3 3 3 1.5 1.5 1.5 1.5 1.5 1.5
of channel along thalweg       0       1       2       3         structure: ex. riffle-pool, step-pool, sequence       0       1       2       3         seq of stream substrate       0       1       2       3         at floodplain       0       1       2       3         al bars or benches       0       1       2       3         al bars or benches       0       1       2       3         at trol       0       1       2       3         at trol       0       0       1       2       3         at trol       0       0.5       1       1.5         at trol       0       0.5       1       2       3         at trol       0       0       0.5       1       1.5         at trol       0       0       0.5       <	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 1 1 1 1 0.5 0.5 0.5 = 0	2 2 2 2 1 1 1 Yes =	3 3 3 3 3 1.5 1.5 1.5 1.5 1.5 1.5 1.5
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al bars or benches       0       1       2       3         avial deposits       0       1       2       3         trol       0       0.5       1       1.5         alley       0       0.5       1       1.5         alley       0       0.5       1       1.5         or greater order channel       No = 0       Yes = 3         es are not rated; see discussions in manual       Yes = 3         gy (Subtotal = 8.0       0       1       2       3         et of Baseflow       0       1       2       3         zing bacteria       0       1       2       3         at on plants or debris       0       0.5       1       1.5         debris lines or piles       0       0.5       1       1.5         devidence of high water table?       No = 0       Yes = 3         (Subtotal = 6.0       )       0       1       0         pland plants in streambed       3       2       1       0         nthos (note diversity and abundance)       0       1       2       3         Mollusks       0       0.5       1       1.5	0 0 0 0 0 0 No 0 1.5 0 0 No	1 (1) (0.5) (0.5) = 0	2 2 1 1 1 Yes =	3 3 1.5 1.5 = 3 3 0 1.5 1.5
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trol	0 0 No No No No No No No No No No No No No	0.5 0.5 = 0 1 1 0.5 0.5 = 0	2 2 0.5 1 Yes =	1.5 1.5 = 3 3 3 0 1.5 1.5
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regreater order channel  res are not rated; see discussions in manual  gy (Subtotal = 8.0  ref Baseflow  ref Basef	0 0 1.5 0 0 No	= 0 1 1 0.5 0.5 0.5	2 2 0.5 1 1 Yes =	3 3 0 1.5 1.5
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gy (Subtotal = 8.0 )  e of Baseflow 0 1 2 3  zing bacteria 0 1.5 1 0.5 0  to on plants or debris 0 0.5 1 1.5  debris lines or piles 0 0.5 1 1.5  devidence of high water table? No = 0  (Subtotal = 6.0 )  cots in streambed 3 2 1 0  pland plants in streambed 3 2 1 0  onthos (note diversity and abundance) 0 1 2 3  Mollusks 0 0 0.5 1 1.5	0 1.5 0 0 No	0.5 0.5 = 0	2 0.5 1 Yes =	3 0 1.5 1.5
e of Baseflow       0       1       2       3         zing bacteria       0       1       2       3         1.5       1       0.5       0         t on plants or debris       0       0.5       1       1.5         debris lines or piles       0       0.5       1       1.5         de evidence of high water table?       No = 0       Yes = 3         (Subtotal = 6.0)       0       Yes = 3         cots in streambed       3       2       1       0         pland plants in streambed       3       2       1       0         nthos (note diversity and abundance)       0       1       2       3         Mollusks       0       1       2       3         0       0.5       1       1.5	0 1.5 0 0 No	0.5 0.5 = 0	2 0.5 1 Yes =	3 0 1.5 1.5
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1.5	1.5 0 0 No	0.5 0.5 = 0	0.5 1 1 Yes =	0 1.5 1.5
ton plants or debris  ton plants or debris  debris lines or piles  0 0.5  1 1.5  devidence of high water table?  No = 0  (Subtotal = 6.0  pland plants in streambed  3 2 1 0  pland plants in streambed  3 2 1 0  nthos (note diversity and abundance)  follusks  0 1.5  1.5	0 0 No	0.5 0.5 = 0	1 1 Yes =	1.5 1.5
debris lines or piles     0     0.5     1     1.5       de evidence of high water table?     No = 0     Yes = 3       (Subtotal = 6.0	0 No	0.5	Yes =	1.5
devidence of high water table? No = 0  (Subtotal = $6.0$ bots in streambed 3 2 1 0  pland plants in streambed 3 2 1 0  onthos (note diversity and abundance) 0 1 2 3  Mollusks 0 1 2 3	No No	= 0	Yes =	
(Subtotal = 6.0 )         posts in streambed       3       2       1       0         pland plants in streambed       3       2       1       0         nthos (note diversity and abundance)       0       1       2       3         Mollusks       0       1       2       3         0       0.5       1       1.5	3			= 3
boots in streambed     3     2     1     0       pland plants in streambed     3     2     1     0       nthos (note diversity and abundance)     0     1     2     3       Mollusks     0     1     2     3       0     0.5     1     1.5		2		
pland plants in streambed     3     2     1     0       nthos (note diversity and abundance)     0     1     2     3       Mollusks     0     1     2     3       0     0.5     1     1.5		2		
Inthos (note diversity and abundance)     0     1     2     3       Mollusks     0     1     2     3       0     0.5     1     1.5	3			0
Mollusks 0 1 2 3 0 0.5 1 1.5		2	1	0
0 0.5 1 1.5	0	1	2	3
	0	1	2	3
0 05 15	0	0.5	1	1.5
0.0	0	0.5	1	1.5
ns 0 0.5 1 1.5	0	0.5	1	1.5
	0	0.5	1	1.5
0 0.5 1 1.5		FACW = 0.75;	OBL = 1.5 Other = 0	
0 0.5 1 1.5  plants in streambed FACW = 0.75; OBL = 1.5 Other = 0	p. 35 of manual			
		FACW = 0.7	'5;	/5; OBL = 1.5 Other = 0
ns 0 0.5 1	0 0 0 0	0.5 0.5 0.5 0.5 FACW = 0.75;	1 1 1	
	U		ODI 45 OU	
			OBL = 1.5 Other = 0	
plants in streambed FACW = 0.75; OBL = 1.5 Other = 0	p. 35 of manual	•		
plants in streambed FACW = 0.75; OBL = 1.5 Other = 0				
plants in streambed FACW = 0.75; OBL = 1.5 Other = 0				
plants in streambed FACW = 0.75; OBL = 1.5 Other = 0	1			
plants in streambed FACW = 0.75; OBL = 1.5 Other = 0	Lai	rge corrugated metal p	pipe culvert	
plants in streambed FACW = 0.75; OBL = 1.5 Other = 0 eams may also be identified using other methods. See p. 35 of manual.	wav			
		Pool/ Pond	Pool/Pond Large corrugated metal p	p. 35 of manual.  Pool/ Pond

		Stre	Unit	fied Stream M	lethodology f	Form	ginia	m 1)			
Project #		Project Name		Locality	Cowardin	HUC	perennial Date	SAR#	Impact/SAR	Impact	
N/A	DC	C2RVA - Area	06	VA	Class. R2SB3	02080206	3/16/2016		length	Factor	
Nam	e(s) of Evalua	tor(s)	Stream Nam	e and Informa	ation						
J. Bı	ıdnik & K. As	stroth			06-S	TR-S-14	a (also S	TR-12)			
1. Channel C	Condition: Asse	ess the cross-sec	tion of the stream								
	Opt	imal	Subo	ptimal	Conditional Catego Mar	ginal	Po	or	Sev	ere	
		WAR AND AND AND AND AND AND AND AND AND AND	1			less than Severe or	Overwiden		1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point bars/ are present. Acce floodplain or full) bankfull benches. and transverse ba	or active erosion; 80- inks. Vegetative nor natural rock, 100%). AND/OR /bankfull benches ass to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are well likely has access to or newly develope	ew areas of active toted banks. Majority table (60-80%). tion or natural rock-80%) AND/OR tures contribute to nkfull and low flow II defined. Stream o bankfull benches, of floodplains along reach. Transient	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe ower bank slopes. resent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sisent, contribute to torming/present.	widen further. Maj	ority of both banks frosion present on ks. Vegetative nt on 20-40% of fficient to prevent R 60-80% of the ed by sediment. iorary/transient in puting to instability.	Deeply incised vertical/lateral ininicision, flow con banks. Streambe rooting depth, m vertical/lunderc protection present c banks, is not pre Obvious bank sit Erosion/raw ban AND/OR Aggrading	stability. Severe tained within the de below average hajority of banks ut. Vegetative on less than 20% of vventing erosion. Dughing present. ks on 80-100%.	
	sediment deposition 10% of	on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depor	nks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	С
Score	3	3	2	.4		2	1.	6	1		2.0
		Accase both bank	'e 100 foot rinaria	an areas along the	a entire SAP (ro	uah messuremen	ts of length & wid	th may be accen	tahla)		
Z. KIPAKIAI		Assess both bank	Con	an areas along the ditional Cate ptimal	gory	ugh measuremen	ts of length & wid		notes>>		
Riparian Buffers	Opti	imal  > 3 inches) present, anderstory. Wetlands	Con	ditional Cate	gory	Ginal  Low Marginal:  Non-maintained, dense herbaceous vegetation,					
Riparian Buffers	Opti Tree stratum (dbh : with > 60% tree cr. non-maintained un	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, ir iparian areas lacking shrub and tree stratum, hor production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anderstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed jobs, active feed of other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree conon-maintained un located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream bant each by measurin score for each ries.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both abrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5 he sums iparian qual 100			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree or non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
Riparian Buffers  Condition Scores  Delineate rip descriptors. Less petermine scoelow. Less petermines scoelow. Less pete	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bani each by measurin Score for each ri 50% 0.75	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * Si		-
Riparian Buffers  Condition Scores  Delineate rip descriptors. Delescriptors. Enter the % l	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream bank each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High 0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in parian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5 he sums iparian qual 100	NOTES>>	cores*0.01)/2 0.63 0.90	Ci 0.7′
Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. Right Bank  Left Bank  3. INSTREAL	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  M Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin  Score for each ri  50%  0.75  30%  0.75  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.5  40% 0.85  zes, water velocit	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy Cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. (and the blocks below 1.1  ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >  NOTES>>	0.63	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the %  Right Bank  Left Bank  3. INSTREAl undercut banks;	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5  each stream bank each by measurin Score for each ri 50% 0.75  30% 0.75  aried substrate si iffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.5  40% 0.85  zes, water velocit exes, stable feature	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (In the blocks below 1.1  ty and depths; wores.  Conditiona	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the rovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t     of % R     Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	0.63	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREAI undercut banks; Instream Habitat/	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream bani each by measurin  Score for each ri  50%  0.75  30%  0.75  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.5  40% 0.85  zes, water velocit exes, stable featur	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (coungth and width. (coungth and counge) 1.1  and the blocks below  1.1  ty and depths; wo res.  Conditiona ptimal	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, inparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t  of % R  Blocks e	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >  NOTES>>	0.63	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREAI undercut banks; Instream	Tree stratum (dbh: with > 60% tree co. non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  M Riparian Area> Score >  M HABITAT: V: root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream bank each by measurin 50% 0.75  30% 0.75  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating leeparian category in 50% 0.5  40% 0.85  zes, water velocitixes, stable features suboptimes sub	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy Recent cutover (dense vegetation).  Low 1.1  Categories and Congth and width. (and the blocks below 1.1  ty and depths; wo res.  Conditiona ptimal  ments are typically % of the reach and realineance of	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High 0.85  Calculators are provided in the control of the c	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, in riparian areas lacking shrub and tree stratum, has production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the covided for you  ginal  ments are typically % of the reach and or maintenance of or maintenance of or maintenance of or maintenance of or maintenance of or maintenance of or selections.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure t of % R Blocks e  Habitat elements lacking or are ulements are typic	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  he sums iparian qual 100 100%  100%  Ilsted above are stable. Habitat lily present in less	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >  NOTES>>	0.63	0.7
Condition Scores  1. Delineate rip descriptors. 2. Determine sc below. 3. Enter the % Right Bank  Left Bank  3. INSTREAl undercut banks; Instream Habitat/ Available	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >  M HABITAT: Vi. root mats; SAV; r  Opti Habitat elements a in greater than 5	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream bank each by measurin 50% 0.75  30% 0.75  aried substrate si iffle poole completimal are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  Kinto Condition C g or estimating le parian category in 50% 0.5  40% 0.85  zes, water velocit exes, stable featur  Subop  Stable habitat ele present in 30-509 are adequate fo popul	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 1.1  by and depths; wores.  Conditional ments are typically who file reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the rovided for you  bris; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % Reserved Blocks estable Blocks	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  he sums iparian qual 100  100%  100%  Iness; shade;	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >  NOTES>>	0.63	

	St	ream In	npact A	ssessm	ent For	m Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX VA			R2SB3	02080206	3/16/2016	06STRS14a		
	CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, bankments, spoil piles, constrictions, livestock  Conditional Category								
	Negligible	Mir	nor	Mod	erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel alterations listed in	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	disrupted by any alterations listed guidelines AND/C	in the parameter DR 80% of banks bion, riprap, or		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

INSERT PHOTOS:



Top Left: Culverts 23 and 24
Top Right: Typical view upstream
Bottom Left: Typical view of stream
Bottom Right: Typical view of stream

**NC DWQ Stream Identification Form Version 4.11** 

### 06-STR-S-14a

Date: 3/16/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.430017
Evaluator: J. Budnik, K. Astroth	County: Chesterfield	Longitude: -77.433521
<b>Total Points:</b> $38.75$ Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

if ≥ 19 or perennial if ≥ 30*	e.g. Quad Name.						
A 0	Absort	Maal.	Madagata	Ct			
A. Geomorphology (Subtotal = 17 )	Absent	Weak	Moderate	Strong			
1 <sup>a.</sup> Continuity of channel bed and bank	0	11	(2)	3			
2. Sinuosity of channel along thalweg	0	(1)	2	3			
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3			
4. Particle size of stream substrate	0	1	(2)	3			
5. Active/relict floodplain	0	1	2	3			
6. Depositional bars or benches	0	1	(2)	3			
7. Recent alluvial deposits	0	1	2	3			
8. Headcuts	0	1)	2	3			
9. Grade control	0	0.5	1	1.5			
10. Natural valley	0	0.5	1	1.5			
11. Second or greater order channel	No	0 = 0	Yes	= 3			
artificial ditches are not rated; see discussions in manual							
B. Hydrology (Subtotal = $8$				_			
12. Presence of Baseflow	0	1	2	(3)			
13. Iron oxidizing bacteria	0	1	(2)	3			
14. Leaf litter	1.5	1	0.5	0			
15. Sediment on plants or debris	0	0.5	1	1.5			
16. Organic debris lines or piles	0	0.5		1.5			
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3			
C. Biology (Subtotal = <u>13.75</u> )			•				
18. Fibrous roots in streambed	3	2	1	0			
19. Rooted upland plants in streambed	3	2	1	0			

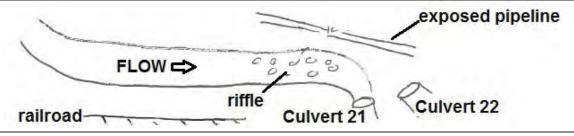
18. Fibrous roots in streambed	3	2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	$\mathfrak{D}$	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		ACW = 0.75	OBL = 1.5 Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Tributary to the James River. Substrate varies (sand, gravel, cobble). Clear running water. Field Sheet:

17-B-STR-11.

Sketch:



		Stre			ment Methodology f		(For	m 1)			
			For use in	wadeable chan	nels classified a	s intermittent or	perennial		Impact/SAR	Impact	
Project #		Project Name	)	Locality	Class.	HUC	Date	SAR#	length	Factor	
N/A		2RVA - Area		VA	R2SB3	02080206	3/16/2016				
	e(s) of Evalua dnik & K. A	` '	Stream Nam	e and Informa	ation	06-STR	C 11h				
			tion of the other care				14D				
Channel	Condition: Asse			С	Conditional Catego	ry					
	Opti	mal	Subo	ptimal	Mar	ginal	Po	or	Sev	ere	
	1	Who have	Slightly incised for	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		Describing		
Channel Condition	Very little incision of 100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Accefoodplain or fully bankfull benches. and transverse be	n or natural rock, 00%). AND/OR bankfull benches as to their original or developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to skfull and low flow II defined. Stream o bankfull benches, d floodplains along	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to	widen further. Maji are near vertical. E 60-80% of banl protection preses banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contril	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the bed by sediment. orary/transient in outing to instability.	Deeply incised vertical/lateral in: incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank slc Erosion/raw ban	stability. Severe tained within the delow average aportity of banks ut. Vegetative on less than 20% of venting erosion. Bughing present.	
	sediment depositio	n covers less than	sediment cover	reach. Transient is 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	forming/present. ed channels have ion on > 40% of the ional features which to stability.	AND/OR V-shape vegetative protectic 40% of the bar sediment depos	on is present on > iks and stable	AND/OR Aggrading than 80% of stream deposition, contrib Multiple thread of subterran	g channel. Greater bed is covered by uting to instability. channels and/or	CI
Score	3	3	2	.4	:	2	1.	6	1		2.0
NOTES>>				Field Sh	eet: 14-B-S	I R-11 - Da	ta Point 2.				
. RIPARIAI	N BUFFERS: A	Assess both bank	s's 100 foot riparia	an areas along the	e entire SAR. (ro			h may be accep	table)		
. RIPARIAI			Con	ditional Cate	gory	ugh measuremen	ts of length & widt		table)		
RIPARIAI Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	imal  3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree		gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained					
Riparian	Opti  Tree stratum (dbh - with > 60% tree ca	imal  3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti  Tree stratum (dbh - with > 60% tree ca	imal 3 inches) present, anopy cover and a derstory. Weltands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active fee lots, trails, or or other comparable conditions.			
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scoelow.	Opti	imal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban ach by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present the second of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5			
Riparian Buffers  Condition Scores  Delineate ripescriptors. Determine scelow.	Tree stratum (dbh > with > 60% tree canon-maintained und located within the	imal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present the second of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5	NOTES>>		
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % I	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban ach by measuring Score for each r 30%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating leparian category in 70%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present the second of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5		cores*0.01)/2 0.53	CI
Condition Scores  Delineate ripescriptors. Determine scelow. Enter the % I	Tree stratum (dbh > with > 60% tree conon-maintained und located within the located withi	imal  3 inches) present, anopy cover and a defeatory. Wetlands for liparian areas.  5  each stream ban ach by measurin Score for each r 30% 0.6	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 70% 0.5	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present the second of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Le sums iparian qual 100 100%	NOTES>>  Cl= (Sum % RA * Si		CI 0.63
Riparian Buffers  Condition Scores  Delineate ripsecriptors. Determine solow. Enter the % I	Tree stratum (dbh > with > 60% tree or non-maintained und located within the located with	5  sach stream ban ach by measurin Score for each r 30% 0.6 30% 0.85 aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 70% 0.5  30% 0.75  Zes, water velocit	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/">https://doi.org/10.100/j.nc/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure tt of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >	0.53	
Condition Scores  Delineate rip: secriptors. Determine scolow. Enter the % I Right Bank  Left Bank  INSTREAL	Tree stratum (dbh > with > 60% tree canon-maintained une located within the located withi	imal  3 inches) present, anopy cover and a dierstory. Wetlands er riparian areas.  5  ach stream ban each by measuring score for each race of the stream ban	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 70% 0.5  30% 0.75  zes, water velocit exes, stable feature	ditional Categoritimal  Low Suboptimal: Riparian areas with tree stratum (dbh 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Coungth and width. Coungth and width. Coungth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (6th >3 inches) present, with +30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 10.5  L	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.53	
Condition Scores  Delineate rip. Socriptors. Determine scolow. Enter the % I Right Bank  Left Bank  INSTREAI ndercut banks; Instream Habitat/	Tree stratum (dbh > with > 60% tree or non-maintained und located within the located with	imal  3 inches) present, anopy cover and a dierstory. Wetlands er riparian areas.  5  ach stream ban each by measuring score for each race of the stream ban	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 70% 0.5  30% 0.75  zes, water velocit exes, stable featur	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure tt of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.53	
Condition Scores  Delineate ripescriptors Determine scelebre Lenter the % I Right Bank  Left Bank Left Bank INSTREAI	Tree stratum (dbh > with > 60% tree oc onon-maintained und located within the located wit	imal  3 inches) present, anopy cover and a dierstory. Wetlands er riparian areas.  5  ach stream ban each by measuring score for each race of the stream of	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches with tree stratum (dbh - 3 inches present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leeparian category in 70% 0.5  30% 0.75  zes, water velocitions, stable feature stable feature suboptimes stable feature suboptimes stable feature suboptimes stable feature suboptimes stable feature suboptimes subop	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High 0.85  Calculators are provided at Category Mar. Stable habitat ele present in 10-30% are adequate for are part of the control of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory. Low  0.75  sing the ovided for you  priss; stable substr	High Poor: Lawns, mowed, and maintained areas, nurseries; no-fill cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	NOTES>>  CI= (Sum % RA * Si Rt Bank CI >  Lt Bank CI >	0.53	

	St	ream In	npact A	ssessm	ent For	m Pag	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX	CSX VA			02080206	3/16/2016	06STRS14b		
	NEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, ts, spoil piles, constrictions, livestock  Conditional Category								
	Negligible	IVIII	nor	40 - 60% of reach	erate 60 - 80% of reach	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	is disrupted by any of the channel alterations listed in	is disrupted by any of the channel	Greater than 8 disrupted by an alterations listed guidelines AND/0	30% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or nent.		
SCORE	1.5	1.3	1.1	0.9	0.7	_	.5	1	

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Typical view upstream

Top Right: Typical view upstream in open area

Bottom Left: Typical view downstream
Bottom Right: Typical view of area without cobble substrait

NC DWO Stream Identification Form Version 4.11

06-STR-S-14b

Date: 3/16/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.423159
Evaluator: J. Budnik, K. Astroth	County: Chesterfield	Longitude: -77.431058
<b>Total Points:</b> 37.75 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

•				
A. Geomorphology (Subtotal = 17.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	$\bigcirc$	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1)	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes	= 3
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 7.5				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5

16. Organic debris lines or piles 1.5 No = 0 17. Soil-based evidence of high water table? Yes = 3

C. Biology (Subtotal = 12.75 18. Fibrous roots in streambed 0 3 19. Rooted upland plants in streambed 0 20. Macrobenthos (note diversity and abundance) 3 1 3 21. Aquatic Mollusks 0 22. Fish 1.5 0 0.5 23. Crayfish 0 0.5 1 1.5 24. Amphibians 0 0.5 1.5 25. Algae 0.5 0 1.5 ACW = 0.75 OBL = 1.5 Other = 0 26. Wetland plants in streambed

\*perennial streams may also be identified using other methods. See p. 35 of manual.

intermittent

Notes: Stream flows into Cul-26, but the culvert is clogged and the stream overflows into 17-B-STR-12. Field Sheet: 17-B-STR-11 Data point 2.

Culvert 26 Sketch: FLOW 17-B-STR-12

		Stre		fied Stream M	lethodology f	or use in Virg	jinia	III I <i>)</i>			
Project #		Project Name		wadeable chan	nels classified a Cowardin Class.	s intermittent or HUC	perennial Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Area 06		VA	R4SB3	02080206	3/16/2016		longin	ruotor		
Nam	e(s) of Evalua	e(s) of Evaluator(s) Stream Name and		e and Informa	ation						
J. Bu	ıdnik & K. As	stroth				06-STF	R-S-15a				
1. Channel (	Condition: Asse	ess the cross-sec	tion of the stream								
	Optimal		Subo	ptimal	onditional Catego Mar	ginal	Po	or	Sev	ere	
	1	The state of the s			Often incised, but	less than Severe or	Overwiden	ed/incised.	1	5	
Channel Condition	100% stable ba surface protectio prominent (80-1 Stable point barsi are present. Acce floodplain or fully bankfull benches. and transverse ba	on or natural rock, 100%). AND/OR /bankfull benches ess to their original y developed wide Mid-channel bars, ars few. Transient	erosion or unproted of banks are stogetative protect prominent (60). Depositional feat stability. The bar channels are wellikely has access to rewly develope	ew areas of active cted banks. Majority table (60-80%). titon or natural rock-80%) AND/OR tures contribute to nkfull and low flow III defined. Stream o bankfull benches, def loodplains along reach. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe wer bank slopes. esent on 40-60% of tative protection on Streambanks may creut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Maj	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the bed by sediment. orary/transient in outing to instability.	Legipl included for exclusively.  Is vertical/lateral instability. Severe in incision, flow contained within the banks. Streambed below average trooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion.  Obvious bank sloughing present.  Erosion/raw banks on 80-100%.		
	sediment deposition 10% of	on covers less than bottom.	sediment cover	rs 10-40% of the bottom.	AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depos	iks and stable			С
Score	3	3	2	2.4		2	1.	6	1		1.0
DIDADIA	N DIJECEDS.	A b b	d- 400 ft didi-		- anti-a CAD (no.			-STR-12.	4-k-)		
2. RIPARIA	N BUFFERS: /	Assess both bank	Con	an areas along the	gory			h may be accep	notes>>		
2. RIPARIAI Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con	ditional Cate	gory	ugh measuremen	ts of length & wid	h may be accep			
Riparian Buffers	Opti	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with < 30% tree canopy cover with maintained	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or			
Riparian	Opti Tree stratum (dbh: with > 60% tree cc non-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory, Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree cron-maintained un located within th	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5 each stream ban each by measurin	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both shrub layers or a non-maintained understory.  High 1.2  Into Condition C g or estimating leparian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (dense)	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine so below.	Tree stratum (dbh: with > 60% tree cron-maintained un located within th	imal  > 3 inches) present, anopy cover and a derstory. Wetlands er riparian areas.	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh s 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (dense)	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.			
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine scoelow. 3. Enter the %	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban each by measurin Score for each ri 40% 0.75	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 60% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, conditions.  Low 0.5  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * S		<del> </del>
Riparian Buffers  Condition Scores  Delineate rip Escoriptors. Les Determine scoelow. Enter the %	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area>	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin Score for each ri	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating leparian category in 60%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (dense)	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indicators are production of the conditio	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, right and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums iparian qual 100	NOTES>>	cores*0.01)/2 0.60 0.88	C:
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREA	Tree stratum (dbh: with > 60% tree cc non-maintained un- located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  % Riparian Area> Score >	imal  > 3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin 40% 0.75  50% 0.75  aried substrate si	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 60% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy Cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 1.1  ty and depths; wo	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/a/">https://doi.org/10.100/j.nc/a/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the  ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel folist, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >  Lt Bank CI >  NOTES>>	0.60	
Riparian Buffers  Condition Scores  1. Delineate rip descriptors. 2. Determine su below. 3. Enter the % Right Bank  Left Bank  Left Bank  Jundercut banks	Tree stratum (dbh: with > 60% tree canon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands te riparian areas.  5  each stream ban each by measurin 40% 0.75  50% 0.75  aried substrate si iffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 60% 0.5  20% 0.85  zes, water velocit exes, stable featu	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided the condition of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	ts of length & widd  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%	C  = (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>> No shade.	0.60	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. Right Bank  Left Bank  3. INSTREA	Tree stratum (dbh: with > 60% tree conon-maintained un located within the located within	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  40%  0.75  50%  0.75  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 60% 0.5  20% 0.85  zes, water velocit exes, stable featu  Subo  Stable habitat ele present in 30-50%	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (In the blocks below  1.1  ty and depths; wo res.  Conditiona ptimal ments are typically % of the reach and	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in Category  w.  Stable habitate lepresent in 10-30%	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you  ginal ments are typically % of the reach and	ts of length & wide  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  Blocks en  Habitat elements lacking or are ur	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>>  CI= (Sum % RA * S  Rt Bank CI >  Lt Bank CI >  NOTES>>	0.60	
Condition Scores  1. Delineate rip descriptors. 2. Determine so below. 3. Enter the % Right Bank  Left Bank  3. INSTREA undercut banks Instream Habitat/	Tree stratum (dbh: with > 60% tree cc non-maintained un located within th located within th  1. arian areas along quare footage for e Riparian Area and % Riparian Area> Score >  M Riparian Area> Score >  M HABITAT: Vi ; root mats; SAV; r	imal  3 inches) present, anopy cover and a derstory. Wetlands le riparian areas.  5  each stream ban each by measurin  Score for each ri  40%  0.75  50%  0.75  aried substrate si iffle poole completimal  are typically present	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 60% 0.5  20% 0.85  zes, water velocitixes, stable features suboptimes stable features suboptime	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. (and the blocks below 1.1  ty and depths; wo res.  Conditional pptimal ments are typically	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nes/">https://doi.org/10.100/j.nes/</a> High 0.85  I Calculators are provided and leafy detection of the state o	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  ginal ments are typically	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure to of % R Blocks en  Blocks en  High  Diagram of the blocks en  Blocks en  Habitat elements	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	C  = (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>> No shade.	0.60	

	St	ream In	npact A	ssessm	ent Fo	rm Page	e 2		
Project #	Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
N/A	CSX VA			R4SB3	02080206	3/16/2016	06STRS15a		
	CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, sankments, spoil piles, constrictions, livestock  Conditional Category								ed
	Negligible	Mir	nor	Mode	erate	Sev	/ere		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	the channel	is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by an alterations listed guidelines AND/0	30% of reach is y of the channel in the parameter DR 80% of banks abion, riprap, or nent.		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5		
	REACH C	ONDITION II	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IIS REACH		

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

0



Top Left: Typical view of stream Top Right: Typical view of stream Bottom Left: Typical view of stream Bottom Right: Typical view of stream

NC DWQ Stream Identification Form Version 4.11

06-STR-S-15a

Date: 3/16/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.426390
Evaluator: J. Budnik, K. Astroth	County: Chesterfield	Longitude: -77.431428
<b>Total Points:</b> $38.25$ Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$	Stream Determination (circle one) Ephemeral Intermitted Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 17)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 7				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5		1.5
17. Soil-based evidence of high water table?	(No	0 = 0	Yes :	= 3
C. Biology (Subtotal = 14.25			•	
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	1	(2)	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed	•	ACW = 0.75	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other metho	ds. See p. 35 of manua	l.		
Notes: This stream flows into STR-11. Field Shee	et: 17-B-STR-12.			
Sketch: FLOW □	>		17-B-STR	-11
17-B-STI		-	17-0-3 IK	
The second secon	/	7	5	
\$	7	7	Culvert 23	
	Culvert 24		Culvert 23	
1 1 1 1 1 1	1		1-1	
The second second second			1	

		Stre	Unit	fied Stream N	lethodology f	or use in Virg		m 1)			
		5 N			nels classified a			242 "	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R4SB3	02080206	3/16/2016				
	e(s) of Evalua Idnik & K. As	` '	Stream Nam	e and Informa	ation	06-STE	R-S-15b				
	Condition: Asse		tion of the stream	and prevailing of	ondition (erosion		1-0-136				
. Onamici c				С	Conditional Catego	ry	Do		Con		
	Opti	mai	Subo	ptimal	Iviar	ginal	Po	or	Sev	ere	
		صوبه هملا	Slightly incised, fu	ew areas of active		less than Severe or stable than Severe	Overwiden Vertically/laterally		Deeply incised	(or excavated)	
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully bankfull benches.	n or natural rock, 00%). AND/OR bankfull benches as to their original of developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wel likely has access to or newly develope	Slightly incised, few areas of active prosion or unprotected banks. Majority of banks are stable (66-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches,		ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be sient, contribute on that contribute to forming/present.	widen further. Majare near vertical. E 60-80% of banl protection presei banks, and is insu erosion. AND/Of stream is covere Sediment is temp nature, and contrib	rosion present on ks. Vegetative nt on 20-40% of fficient to prevent a 60-80% of the ed by sediment. orary/transient in outing to instability.	vertical/lateral in: incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sko Erosion/raw ban	stability. Severe tained within the do below average apority of banks ut. Vegetative on less than 20% of venting erosion. bughing present. ks on 80-100%.	
	and transverse bars few. Transient sediment deposition covers less than 10% of bottom.  In the word reverse the covers less than portions of the reach. Transient sediment covers 10-40% of the stream bottom.		AND/OR V-shap vegetative protecti banks and depositi	ed channels have ion on > 40% of the ional features which to stability.			AND/OR Aggrading channel. Greater		CI		
Score	3	3	2	.4	;	2	1.	6	1		2.0
NOTES>>				Field	Sheet: 14-I	B-STR-12 -	DP #2.				
				-							
. RIPARIAI	N BUFFERS: A	Assess both bank				-		h may be accep			
. RIPARIAI			Con	ditional Cate	gory	ugh measuremen	ts of length & widt		table)		
Riparian Buffers	Opti Tree stratum (dbh > with > 60% tree ca	imal  3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree		gory	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained					
Riparian Buffers	Opti  Tree stratum (dbh - with > 60% tree ca	imal  3 inches) present, anopy cover and a derstory. Wetlands	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained	ditional Cates ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable			
Riparian	Opti  Tree stratum (dbh - with > 60% tree ca	imal 3 inches) present, anopy cover and a derstory. Weltands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active fee lots, trails, or or other comparable conditions.			
Riparian Buffers  Condition Scores  Delineate ripalescriptors. 2. Determine scorelow.	Opti	imal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present the second of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
Riparian Buffers  Condition Scores  Delineate ripaescriptors. Determine scelow.	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal 3 inches) present, anopy cover and a derstory. Wetlands e riparian areas.  5  each stream ban ach by measuring score for each r 50%	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50%	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present the second of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low  0.5			
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % F	Tree stratum (dbh > with > 60% tree canon-maintained und located within the located withi	imal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5 each stream ban ach by measurin	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present the second of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5		cores*0.01)/2	
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow.	Tree stratum (dbh > with > 60% tree co conon-maintained unclocated within the located wit	imal 3 inches) present, anopy cover and a derstory. Wetlands for liparian areas.  5 each stream ban ach by measurin Score for each r 50% 0.85	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.5	ditional Cate ptimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  categories and Co	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are present the second of	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75 sing the	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High 0.6  Ensure to	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5	NOTES>>  CI≕ (Sum % RA * Si  Rt Bank CI >	0.68	CI
Riparian Buffers  Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % f Right Bank	Tree stratum (dbh > with > 60% tree cc non-maintained und located within the located with	imal 3 inches) present, anopy cover and a derstory. Wellands e riparian areas.  5 each stream ban ach by measurin Score for each r 50% 0.85	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating le parian category in 50% 0.5	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/">https://doi.org/10.100/j.nc/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >		CI 0.70
Condition Scores  Delineate ripe escriptors. Determine scelow. Enter the % f	Tree stratum (dbh > with > 60% tree co conon-maintained unclocated within the located wit	5  sach stream ban ach by measurin Score for each r 50% 0.85 aried substrate si	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) resent, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.5	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <a href="https://doi.org/10.100/j.nc/">https://doi.org/10.100/j.nc/</a> High 0.85	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt  of % R  Blocks et	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5  Low 10.5	NOTES>>  CI≕ (Sum % RA * Si  Rt Bank CI >	0.68	
Riparian Buffers  Condition Scores  Delineate rip tescriptors. Determine scoelow. Right Bank  Left Bank  B. INSTREAL	Tree stratum (dbh > with > 60% tree canon-maintained une located within the located withi	55 sach stream ban sach by measurin Score for each r 50% 0.85 aried substrate si ffle poole comple	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.5	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are production of the conditi	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <20% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails conditions.  Low 0.5  Low 10.5  L	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	0.68	
Condition Scores  Delineate ripalescriptors. Deltermine scoelow. English Bank  Left Bank  Left Bank  Instream Habitat/	Tree stratum (dbh > with > 60% tree oc onon-maintained und located within the located wit	imal  3 inches) present, anopy cover and a derstory. Wetlands feer liparian areas.  5  each stream ban ach by measurin  Score for each r  50%  0.85  50%  0.85  aried substrate siffle poole completimal	Con Subo  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 0.5  50% 0.6  zes, water velocit exes, stable featur  Subo  Stable habitat elei	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are provided in the control of the	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substructions are typically ments are typically ments are typically ments are typically ments are typically ments are typically not seen to substruction of the control of the contro	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure tt  of % R Blocks ed  Blocks ed  High  Deliver to the comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Low 0.5  Low 100%  100%	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	0.68	
Condition Scores  Delineate rip descriptors. Delermine scoelow. Right Bank  Left Bank  Left Bank  Instream	Tree stratum (dbh > with > 60% tree oc onon-maintained und located within the located wit	5  sach stream ban sach by measurin Score for each r 50% 0.85  saried substrate si ffle poole comple	Con Suboy  High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canpy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  K into Condition C g or estimating leeparian category in 50% 0.5  50% 0.6  Zes, water velocitixes, stable features suboptimes stable features suboptimes	ditional Categorium Ca	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with -30% tree canopy cover.  High 0.85  Calculators are provided at Category Mar. Stable habitat ele present in 10-30% are adequate for are dequate for a service of the control o	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory. Low  0.75  sing the ovided for you  priss; stable substrations ginal	High Poor: Lawns, mowed, and maintained areas, nurseries; no-fill cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks en  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	NOTES>>  Cl= (Sum % RA * Si Rt Bank Cl >  Lt Bank Cl >	0.68	

Stream Impact Assessment Form Page 2									
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor
N/A	CSX VA			R4SB3	02080206	3/16/2016	06STRS15b		
4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock  Conditional Category									
	Negligible	nor		erate	Sev	rere			
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered oattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in	the channel	of the channel	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized.	Greater than 8 disrupted by an alterations listed guidelines AND/0			
	unanciec patein or has materialized.	the parameter guidelines.	the parameter guidelines.	normal stable stream meander pattern has not recovered.	normal stable stream meander pattern has not recovered.	cem			

### REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

THE REACH CONDITION INDEX (RCI) >>

RCI= (Sum of all Cl's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

#### INSERT PHOTOS:



Top Left: Typical View upstream Top Right: Typical View upstream Bottom Left: Typical view upstream Bottom Right Typical view of stream

NC DWQ Stream Identification Form Version 4.11

### 06-STR-S-15b

Date: 3/16/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.423918
Evaluator: J. Budnik, K. Astroth	County: Chesterfield	Longitude: -77.431025
<b>Total Points:</b> 29.75 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemera Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 15.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0		2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5		1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	·	0 = 0	Yes	
<sup>a</sup> artificial ditches are not rated; see discussions in manual	1	3 – 0	(133	
B. Hydrology (Subtotal = $\frac{4.5}{1.5}$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	7	(2)	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3
C. Biology (Subtotal = $9.75$ )				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	0	0.5		1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		ACW = 0.75	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other method	s. See p. 35 of manua			
Notes: Mostly large pool of water. Very little active	flow. STR 12 bea	comes intermitte	nt after culvert. Stre	eam is also an
overflow channel for STR 11 due to a clogo	ged culvert. Field	Sheet: 17-B-ST	R-12, Data pt 2.	
Sketch:		1 1	1 1	1
T. 10000 -	_			
quivert 25	po			
		200	pol po	OOL
	n goes			
flow rip-rap under	ground		FLOV	V
1				

		Stre	Uni	fied Stream N	lethodology f	or use in Virg		m 1)			
		5 N			nels classified a Cowardin			212 "	Impact/SAR	Impact	
Project #		Project Name		Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA e and Informa	R2SB3	02080206	9/13/2016				
	e(s) of Evaluat taski; R. Mar	` '	Stream Nam	e and inform	ation	06-ST	R-S-16				
	ondition: Asse		tion of the stream	and prevailing c	ondition (erosion.		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \				
	Opti				Conditional Catego		Po	or	Sev	rere	
	y y	ina.	A	Penna.	Л	giriai	N.		///	1	
	The same of the sa	All A	1			less than Severe or	Overwidene		1	5	
Channel Condition	100% stable bar surface protection prominent (80-11 Stable point bars/l are present. Acce- floodplain or fully bankfull benches. and transverse ba	very mitter incision or active erosion; or 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars.		ew areas of active table (60-80%). tion or natural rock -80%) AND/OR urres contribute to okfull and low flow Il defined. Stream o bankfull benches, of floodplains along each. Transient	or Poor due to lo Erosion may be pri both banks. Vege! 40-60% of banks. bevertical or unde 60% of strean sediment. Set temporary/tran instability. Depositi	stable than Severe ewer bank slopes. sesent on 40-60% of tative protection on Streambanks may creat. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present.	Vertically/laterally viden further. Maj are near vertical. E 60-80% of bani protection prese banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contril. AND/OR V-shape	ority of both banks rosion present on cs. Vegetative at on 20-40% of fficient to prevent a 60-80% of the bed by sediment. orary/transient in outing to instability.	banks, is not pre Obvious bank slo Erosion/raw ban	stability. Severe itained within the id below average najority of banks ut. Vegetative on less than 20% of eventing erosion. oughing present.	
	and transverse bars few. Transient sediment deposition covers less than 10% of bottom.		sediment cover	s 10-40% of the bottom.	vegetative protecti banks and depositi	ed channels have on on > 40% of the onal features which to stability.	vegetative protectii 40% of the bar sediment depos	ks and stable	than 80% of stream deposition, contrib Multiple thread of subterran	n bed is covered by outing to instability. channels and/or	CI
Score	3	}	2	.4	:	2	1.	6	1		2.0
2. RIPARIAN	BUFFERS: A		Con	an areas along the ditional Cate	gory	ugh measuremen	ts of length & widt		NOTES>> E		
Riparian Buffers	Tree stratum (dbh > with > 60% tree ca non-maintained und located within the	- 3 inches) present, inopy cover and a derstory. Wetlands	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor:	located to to of the strea railway is letter the left of the left	the right am; the ocated to	
Condition			High	Low	High	Low	High	Low			
Condition Scores	1.	5	1.2	1.1	0.85	0.75	0.6	0.5			
lescriptors. 2. Determine squelow.	rian areas along e uare footage for e Riparian Area and	ach by measurin Score for each ri	g or estimating le	ngth and width. (	Calculators are pr		Ensure the of % R	iparian qual 100			
Right Bank	% Riparian Area>	80% 1.1	20% 0.5					100%			
	000167	1.1	0.0						CI= (Sum % RA * S	cores*0.01)/2	
	% Riparian Area>	50%	50%					100%	Rt Bank CI >	0.98	CI
Left Bank	Score >	1.2	0.75						Lt Bank CI >	0.98	0.98
	LUADITAT	STREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; NOTES>>									
3. INSTREAM	// HABITAT: Va				ody and loary do.	,,, otable edbet					
3. INSTREAM	root mats; SAV; ri	ffle poole comple	exes, stable featu	res. Conditiona	I Category						
3. INSTREAM undercut banks; Instream Habitat/	root mats; SAV; ri	ffle poole comple	Subo Stable habitat ele	Conditiona ptimal ments are typically	I Category  Mare  Stable habitat ele	ginal ments are typically	Po Habitat elements	or listed above are			
3. INSTREAM undercut banks; Instream	root mats; SAV; ri	ffle poole comple mal re typically present	Subo Stable habitat ele present in 30-50% are adequate fo	res. Conditiona ptimal	Stable habitat ele present in 10-30% are adequate fo	ginal	Po	Or listed above are stable. Habitat ally present in less			CI

#### **Stream Impact Assessment Form Page 2** Applicant Locality Cowardin Class HUC Data Point SAR length Project # Date Impact Factor N/A CSX R2SB3 02080206 3/14/2016 06STR-S16 4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, NOTES>> embankments, spoil piles, constrictions, livestock Conditional Category Moderate The channel is modified near the Negligible Minor Severe Elliham road by a 40 - 60% of reach 60 - 80% of reach is disrupted by an of the channel alterations listed in s disrupted by any of the channel alterations listed in culvert and rip-rap. Less than 20% of 20-40% of the Greater than 80% of reach is Channel the stream reach stream reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks the parameter the parameter Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized. s disrupted by an of the channel alterations listed in srupted by any o the channel Iterations listed in Alteration guidelines. If stream has beer guidelines. If stream has beer channelized, channelized, shored with gabion, riprap, or the parameter the parameter normal stable stream meander pattern has not normal stable stream meander pattern has not guidelines. guidelines. recovered. CI SCORE 1.5 1.3 1.1 0.9 0.7 0.5 1.10 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number

RCI= (Sum of all CI's)/5 COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

#### **INSERT PHOTOS:**



Top Left: Stream channel, culverts, and rip-rap.

Top Right: Stream channel.

NC DWQ Stream Identification Form Version 4.11

### 06-STR-S-16

Date: 09/13/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.424759
Evaluator: L. Postaski, R. Magnum	County: Chesterfield	Longitude: -77.430430
<b>Total Points:</b> 36 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 16.5)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	$\bigcirc$	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No	0 = 0	Yes:	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $8.5$ )				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	0_	1.5
17. Soil-based evidence of high water table?	No	0 = 0	Yes:	= 3
C. Biology (Subtotal = <u>11.0</u> )		_		
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75,	OBL = 1.5 Other = 0	)
*perennial streams may also be identified using other method	•	l.		
Notes: This is an unnamed tributary to the James	River.			
Rai	ilway			
Sketch: Rai	iiway		<u> </u>	
		Culvert	Flibam RA	
_ >		d	3	
$\rightarrow$	<b>&gt;</b>	<del></del>	2	
	_~	$\overline{}$		
	~	Riprap		

# Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

	For use in ephemeral streams								
Project #	Project Name	Locality	Cowardin Class.	нис	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Area 06	VA	R6	02080206	3/16/2016				

Name(s) of Evaluator(s) Stream Name and Information

J. Budnik & K. Astroth

06-STR-S-17

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

	NOTES>>							
	Optimal	Subo	ptimal	Ma	Marginal Po			Stream goes under
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	tree stratum (dbh > 3 inches) present, with 30% to 60%	Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a	eitner a snrub layer	Low Marginal: Non- maintained, dense herbaceous vegetation, riparian areas tacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	surraces, mine spoil lands,	maintained pipeline/powerline ROW. Field Sheet: 17-B-STR-13.
		High	Low	High	Low	High	Low	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	
Delineate ripar	rian areas along each stream bank	into Condition Cat	egories and Condi	tion Scores using	the descriptors.	Ensure t	he sums	
2. Determine squ	uare footage for each by measuring	or estimating leng	th and width. Cal	culators are provid	ded for you below.	of % R	Riparian	
3. Enter the % Ri	iparian Area and Score for each rip	arian category in t	he blocks below.			Blocks e	qual 100	
Right Bank	% Riparian Area> 70%	30%					100%	
rtight Bank	Score > <b>0.85</b>	0.6						
	·							CI= (Sum % RA * Scores*0.01)/2

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

0.85

0.6

THE REACH CONDITION INDEX (RCI) >> 0.39 RCI= (Riparian CI)/2

Rt Bank CI >

Lt Bank CI >

COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF

0.78

0.78

CI

0.78

**INSERT PHOTOS:** 

Left Bank



Top Left: View upstream from confluence with STR-11 Top Right: View downstream toward railroad from CUL- 29 Bottom Left: View upstream at CUL-29 Bottom Right: View downstream toward CUL-29

Project/Site: DC2RVA - Area 06

NC DWQ Stream Identification Form Version 4.11

Date: 3/16/2016

06-STR-S-17

Latitude: 37.422290

Evaluator: J. Budnik, K. Astroth	County: Cheste	erfield	Longitude: -77.431264		
Total Points: 15.75	Stream Determ	ination (circle one)	Other		
Stream is at least intermittent	Ephemeral Inte	ermittent Perennial	e.g. Quad Name:		
if ≥ 19 or perennial if ≥ 30*					
A. Geomorphology (Subtotal = 4)	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	(1)	2	3	
2. Sinuosity of channel along thalweg	(0)	1	2	3	
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
Particle size of stream substrate	0		2	3	
5. Active/relict floodplain	0	7	2	3	
6. Depositional bars or benches	(0)	1	2	3	
7. Recent alluvial deposits	0	(1)	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	1	1.5	
11. Second or greater order channel	ond or greater order channel No = 0				
<sup>a</sup> artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = 6.5					
12. Presence of Baseflow	0	1	(2)	3	
13. Iron oxidizing bacteria	0	1	2	(3)	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	N	0 = 0	Yes = 3		
C. Biology (Subtotal = 5.25)			_		
18. Fibrous roots in streambed	3	2	(1)	0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	1	2	3	
21. Aquatic Mollusks	0	T	2	3	
22. Fish		0.5	1	1.5	
23. Crayfish		0.5	1	1.5	
24. Amphibians		0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		ACW = 0.75 OB	L = 1.5 Other = 0	)	
*perennial streams may also be identified using other meth	-				
Notes: Likely stormwater flow from nearby resid	ential area. Field St	neet: 17-B-STR-13.			
1.414	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
Sketch:	pipelin				
Sketch:	Priow power ROW				

Culvert 27

STR-13

# Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

	For use in ephemeral streams								
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor	
N/A	DC2RVA - Area 06	VA	R6	02080206	3/16/2016				

Name(s) of Evaluator(s) Stream Name and Information

J. Budnik & K. Astroth

06-STR-S-18

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAF	R. (rough measurements of length & width may be acceptable)
--	---

	_		Coi	nditional Cate	egory	_			NOTES>>		1
	Optima	ıl	Subor	otimal	Ma	rginal		or	Field Shee	t: 17-B-	ı
Riparian Buffers	Tree stratum (dbh > 3 in with > 60% tree canopy non-maintained underst areas.	nches) present, y cover and an	Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	Low Marginal: Non- maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh -3 inches) present, with <30% tree canopy cover with maintained understory.		Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	STR-14.		
			High	Low	High	Low	High	Low			
Condition Scores	1.5		1.2	1.1	0.85	0.75	0.6	0.5			
. Delineate ripa	rian areas along each	stream bank i	nto Condition Cate	egories and Condi	ition Scores using	the descriptors.	Ensure t	he sums			
. Determine squ	uare footage for each t	by measuring	or estimating leng	th and width. Cal	culators are provid	ded for you below.	of % F	Riparian			
. Enter the % R	iparian Area and Score	re for each ripa	arian category in th	ne blocks below.			Blocks e	qual 100			
Right Bank	% Riparian Area>	30%	55%	15%				100%			
Nigili Dalik	Score >	0.75	0.6	0.5							
									CI= (Sum % RA * S	,	J
Left Bank	% Riparian Area>	60%	20%	20%				100%	Rt Bank CI >	0.63	
20.1 Julik	Score >	0.6	0.75	0.5					Lt Bank CI >	0.61	
		REACH	CONDITION	INDEX and	STREAM CO	NDITION UNIT	S FOR THIS	REACH			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole nur

THE REACH CONDITION INDEX (RCI) >> 0.31 RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: Typical view of stream in construction area near railroad Top Right: Typical view of stream in construction area near railroad

Bottom Left: Typical view of stream adjacent railroad Bottom Right: Typical view of stream along railroad

NC DWO Stream Identification Form Version 4.11

06-STR-S-18

Date: 3/16/2016	Project/Site: DC2RVA - Area 06	<b>Latitude:</b> 37.409580					
Evaluator: J. Budnik, K. Astroth	County: Chesterfield	Longitude: -77.436538					
<b>Total Points:</b> 17.25 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral intermittent Perennial	Other e.g. Quad Name:					

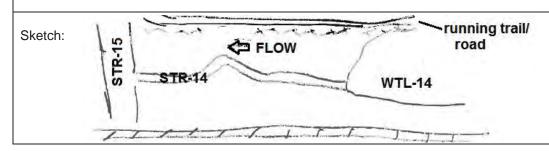
A. Geomorphology (Subtotal = 6.5)	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0		2	3
2. Sinuosity of channel along thalweg	0	$\overline{0}$	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley		0.5	1	1.5
11. Second or greater order channel	N	0 = 0	Yes	= 3
<sup>a</sup> artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $4.5$				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	Ð	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16 Organic debris lines or piles		0.5	1	1.5

16. Organic debris lines or piles 1.5 17. Soil-based evidence of high water table? No = 0Yes = 3

C. Biology (Subtotal = 6.25 1 18. Fibrous roots in streambed 0 2 19. Rooted upland plants in streambed 3 0 20. Macrobenthos (note diversity and abundance) 0 1 2 3 0 3 21. Aquatic Mollusks 2 0 22. Fish 0.5 1.5 23. Crayfish 0 0.5 1 1.5 24. Amphibians 0.5 1.5 0 1 25. Algae 0 0.5 1.5 26. Wetland plants in streambed ACW = 0.75 OBL = 1.5 Other = 0

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream originates from WTL-14. Flows to the south into STR-15 (Kingsland Creek) Field Sheet: 17-B-STR-14.



		Stre			sment Methodology f		<b>) (For</b> i	m 1)			
Project #		Project Name		wadeable chan	nels classified a Cowardin	s intermittent or	perennial Date	SAR#	Impact/SAR	Impact	
-		•			Class.			JAN#	length	Factor	
N/A Nam	e(s) of Evaluat	2RVA - Area		VA e and Informa	R2SB ation	02080206	3/16/2016				
	dnik & K. As	. ,				R-S-19 (	Kingslan	d Creek)			
Channel C	ondition: Asse	ess the cross-sec	tion of the stream	and prevailing co			9				
	Opti	mal	Subo	ptimal c	Conditional Catego Mar	ry ginal	Po	or	Sev	ere	
		مويد جملان	Slightly incised for	ew areas of active		less than Severe or stable than Severe	Overwidene Vertically/laterally		1		
Channel Condition	Very little incision or 100% stable bar surface protection prominent (80-11 Stable point bars/l are present. Acce floodplain or fully bankfull benches, and transverse ba sediment depositio	nks. Vegetative n or natural rock, 00%). AND/OR bankfull benches ss to their original developed wide Mid-channel bars, urs few. Transient n covers less than	erosion or unproted of banks are st Vegetative protect prominent (60- Depositional feat stability. The bar channels are wellikely has access to or newly develope portions of the r	cted banks. Majority table (60-80%), tion or natural rock-80%) AND/OR tures contribute to klfull and low flow I defined. Stream to bankfull benches, d floodplains along each. Transient s 10-40% of the	or Poor due to lo Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran instability. Depositi stability, may be	wer bank slopes. esent on 40-60% of lative protection on Streambanks may yercut. AND/OR 40- n is covered by diment may be sient, contribute on that contribute to forming/present. ed channels have	widen further. Major en ear vertical. E 60-80% of banl protection preser banks, and is insu erosion. AND/OP stream is covere Sediment is temp nature, and contrib AND/OR V-shape vegetative protective protective.	prity of both banks rosion present on the state of the st	incision, flow con banks. Streambe rooting depth, m vertical/underc protection present c banks, is not pre Obvious bank sla Erosion/raw ban	stability. Severe tained within the ad below average apority of banks ut. Vegetative on less than 20% of eventing erosion. Sughing present. ks on 80-100%.  g channel. Greater	
	10% of I	bottom.		bottom.	banks and deposit	on on > 40% of the onal features which to stability.	40% of the ban sediment depos		deposition, contrib Multiple thread of subterran	uting to instability.	CI
Score	3	1	2	.4		2	1.	6	1		2.4
NOTES>>		Some	disturban	ce in powe	nine coma	or / railroad	u. rieiu Sne	et: 14-B-S	)   IX-13.		
	N BUFFERS: A		s's 100 foot riparia	an areas along the	e entire SAR. (ro				otable)		
	N BUFFERS: A	Assess both bank	c's 100 foot riparia		e entire SAR. (ro			h may be accep	otable)	st	
	Opti  Tree stratum (dbh > with > 60% tree ca	mal  3 inches) present, nopy cover and a lerstory. Wellands	C's 100 foot riparia  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh a 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	an areas along the ditional Categoriumal  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Some fores upstream of powerline of	of	
RIPARIAI Riparian Buffers	Opti  Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the	mal  3 inches) present, nopy cover and a derstory. Wetlands riparian areas.	C's 100 foot ripariat  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High	an areas along the ditional Categoriumal Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated nonmaintained area, recently seeded and stabilized, or other comparable condition.  High	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Some fores upstream of powerline of	of	
Riparian Buffers  Condition Scores  Delineate ripasscriptors. Determine scores	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located with	mal  3 inches) present, nopy cover and a lerstory. Wetlands e riparian areas.	Con Subor High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in	can areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	Po High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums parian qual 100	NOTES>> Some fores upstream of powerline of	of	
Riparian Buffers  Condition Scores Delineate ripascriptors. Determine scalow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the	mal  3 inches) present, nopy cover and a lefstory. Wetlands e riparian areas.	Con Subor Subor High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition Co	can areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Congth and width. Congth and width. Congth and congth and width.	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Some fores upstream of powerline of	of corridor.	
Riparian Buffers  Condition Scores Delineate ripasscriptors. Determine scelow. Enter the % I	Tree stratum (dbh > with > 60% tree ca non-maintained unc located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located within the located	mal  3 inches) present, nopy cover and a lefestory. Wetlands e riparian areas.  5 ach stream ban ach by measurin Score for each ri	Con Subor  High Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in 50%	an areas along the ditional Categoriemal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth and width. Congth areas are supported by the congth and width. Congth areas are supported by the congth and width. Congth areas are supported by the congth areas are supported by th	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  ne sums parian qual 100	NOTES>> Some fores upstream of powerline of	of corridor.	CI
Riparian Buffers  Condition Scores Delineate ripascriptors. Determine scolow. Enter the % I	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	mal  3 inches) present, unopy cover and a derstory. Wetlands er riparian areas.  5  each stream ban ach by measurin Score for each ri 50% 0.6	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 1.1	an areas along the ditional Categories and Congth and width. Congt	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  condition Scores us	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th of % R	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, conditions.  Low 0.5  Low 0.5  Low 10.5  L	NOTES>> Some fores upstream of powerline of	of corridor.	CI 0.86
Riparian Buffers  Condition Scores  Delineate rip. Secriptors. Determine sclow. Enter the % I	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	mal  3 inches) present, unopy cover and a letestory. Wetlands er riparian areas.  5  ach by measurin  Score for each ri  50%  0.6  10%  0.6  aried substrate si	Cs 100 foot ripariat  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in 50%  1.1	an areas along the ditional Categories and County Recent cutover (dense vegetation).  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and County Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Indition Scores us Calculators are provinced.	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the Blocks experies the seeded and stabilized and	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	NOTES>> Some fores upstream o powerline o  CI= (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>>	corridor.	
Riparian Buffers  Condition Scores  Delineate rip scriptors. Determine sc low. Enter the % I Right Bank  Left Bank  INSTREAI	Tree stratum (dbh > with > 60% tree cannon-maintained uncertain areas along of the cannon-maintained uncertain areas along of the cannon-maintained uncertain areas along of the cannon-maintained uncertain areas along of the cannon-maintained uncertain areas along of the cannon-maintained uncer	mal  3 inches) present, unopy cover and a letestory. Wetlands er riparian areas.  5  ach by measurin  Score for each ri  50%  0.6  10%  0.6  aried substrate si	Cs 100 foot ripariat  Con  Subo  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High  1.2  k into Condition C g or estimating le parian category in 50%  1.1	an areas along the ditional Categories and County Recent cutover (dense vegetation).  Low Suboptimal: Riparian areas with tree stratum (dbn > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and County Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  Sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denduded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 1005  Low 1006  Low 1009	Cl= (Sum % RA * S Rt Bank Cl >	corridor.	
Riparian Buffers  Condition Scores  Delineate rip Sescriptors. Determine sc Jow. Enter the % I Right Bank  Left Bank  INSTREAI Instream Habitat/	Tree stratum (dbh > with > 60% tree canon-maintained unclocated within the located within	mal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5  ach stream ban ach by measurin 50% 0.6  10% 0.6  aried substrate siffle poole comple	Con Subop  High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2  k into Condition C g or estimating le parian category in 50% 1.1  50% 0.75  Zes, water velocit exes, stable feature	an areas along the ditional Categorithmal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Categories and Coungth and width. Coungth and width. Coungth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present with <30% tree canopy cover.  High  0.85  Calculators are pr	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <a>30</a> % tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you  pris; stable substr	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure th  of % R  Blocks ed  ate; low embeded	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.  Low 0.5  Low 10.5	NOTES>> Some fores upstream o powerline o  CI= (Sum % RA * S Rt Bank CI > Lt Bank CI > NOTES>>	corridor.	
Riparian Buffers  Condition Scores Delineate rips Secriptors. Determine solow. Enter the % I Right Bank  Left Bank  INSTREAI dercut banks; Instream	Tree stratum (dbh > with > 60% tree canon-maintained unc located within the located withi	mal  3 inches) present, nopy cover and a derstory. Wetlands e riparian areas.  5  ach stream ban ach by measurin 50% 0.6  10% 0.6  aried substrate si fflle poole complete mal re typically present	Con Subo High Suboptimal: Riparian areas with tree stratum (dbh - 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.  High 1.2 k into Condition C g or estimating le parian category in 50% 1.1  50% 0.75  zes, water velocit exes, stable featur Subo Stable habitat ele present in 30-50% are adequate fo	to a reas along the ditional Categoretimal  Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).  Low  1.1  Lategories and Coungth and width. Coungth and width. Coungth and width. Coungth and depths; wo res.  Conditional	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.  High  0.85  Addition Scores us Calculators are provided at Category  W.  Stable habitat ele present in 10-30% are adequate for are sent in 10-30% are adequate for are sequented to the sent in 10-30% are adequate for are sequented to the seq	ginal  Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh > 3 inches) present, with <30% tree canopy cover with maintained understory.  Low  0.75  sing the ovided for you	ts of length & widt  Po  High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.  High  0.6  Ensure the of % R  Blocks ed	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feel lots, trails, or other comparable conditions.  Low 0.5  Low 100%  100%  100%	NOTES>> Some fores upstream o powerline o  Cl= (Sum % RA * S Rt Bank Cl> Lt Bank Cl> NOTES>> Muddy wat to see bott	corridor.	

	St	ream In	npact A	ssessm	ent For	m Page	e 2			
Project #	Applicant		Locality	Cowardin Class.	нис	Date	Data Point	SAR length	Impact Factor	
N/A	CSX VA			R2SB	02080206	3/16/2016	06STR-S19			
L. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, mbankments, spoil piles, constrictions, livestock  Conditional Category										
	Negligible	Mir	nor	Mode	erate	Sev	/ere	channelization near		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	of the channel	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	of the channel alterations listed in	is disrupted by any of the channel	Greater than 8 disrupted by an alterations listed guidelines AND/0	80% of reach is y of the channel in the parameter DR 80% of banks bion, riprap, or	railroad		
SCORE	1.5	1.3	1.1	0.9	0.7	0	.5			
	REACH C	ONDITION II	NDEX and S	TREAM CON	NDITION UN	ITS FOR TH	IS REACH			

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >> RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>

0

CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: View downstream toward CUL-30 under railroad

Top Right: View upstream away from railroad Bottom Left: View upstream away from railroad Bottom Right: View of large pool area in stream

## NC DWQ Stream Identification Form Version 4.11 Kingsland Creek 06-STR-S-19

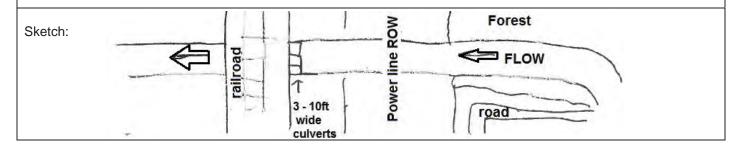
110 2 11 & paramir racinimantal ratio (122)							
Date: 3/16/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.409358					
Evaluator: J. Budnik, K. Astroth	County: Chesterfield	Longitude: -77.436598					
<b>Total Points:</b> 53.5 Stream is at least intermittent if $\geq$ 19 or perennial if $\geq$ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:					

if $\geq$ 19 or perennial if $\geq$ 30*	Ephemeral Intermittent Perennial e.g. Quad Name:						
A. Geomorphology (Subtotal = 23)	Absent	Weak	Moderate	Strong			
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	(3)			
Sinuosity of channel along thalweg	0	1	(2)	3			
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3			
Particle size of stream substrate	0	1	(2)	3			
5. Active/relict floodplain	0	1	2	3			
6. Depositional bars or benches	0	1	(2)	3			
7. Recent alluvial deposits	0	1	2	3			
8. Headcuts	0	1	2	3			
9. Grade control	0	0.5	1	1.5			
10. Natural valley	0	0.5	1	1.5			
11. Second or greater order channel	No	0 = 0	Yes	= 3			
<sup>a</sup> artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 12.5)							
12. Presence of Baseflow	0	1	2	(3)			
13. Iron oxidizing bacteria	0	1	2	3			
14. Leaf litter	1.5	1	0.5	0			
15. Sediment on plants or debris	0	0.5	1	1.5			
16. Organic debris lines or piles	0	0.5	1	1.5			
17. Soil-based evidence of high water table?	No	0 = 0	Yes	= 3			
C. Biology (Subtotal = 18							
18. Fibrous roots in streambed	3	2	1	0			
19. Rooted upland plants in streambed	3	2	1	<u> </u>			
20. Macrobenthos (note diversity and abundance)	0	1	2	(3)			

C. Biology (Subtotal = 10 )				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	∢
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	(2)	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5		1.5
26. Wetland plants in streambed		FACW = 0.75	OBL = 1.5 Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Water is very muddy, strong flow (Kingsland Creek). Field Sheet: 17-B-STR-15.



		Stre				Form	) (For	m 1)			
					nels classified a	s intermittent or	perennial		Impact/SAR	Impact	
Project #		Project Name	•	Locality	Class.	HUC	Date	SAR #	length	Factor	
N/A		2RVA - Area		VA	R4SB	02080206	3/17/2016				
	e(s) of Evalua Idnik & K. As	• •	Stream Nam	e and Informa	ation	06 87	D C 20				
			Contraction of	1			R-S-20				
Channel C	ondition: Asse			С	Conditional Catego	ry					
	Opti	imal	Subo	ptimal	Mar	ginal	Po	or	Severe		
		W.	Slightly incised, for	ew areas of active	Poor. Banks more	less than Severe or stable than Severe		unstable. Likely to	Deeply incised (or excavated),		
Channel Condition	100% stable bar surface protection prominent (80-1) Stable point bars/ are present. Acce floodplain or fully bankfull benches. and transverse ba	n or natural rock, 00%). AND/OR bankfull benches ess to their original developed wide Mid-channel bars,	erosion or unproted of banks are st Vegetative protect prominent (60-Depositional feat stability. The bar channels are wellikely has access to or newly develope portions of the r	cted banks. Majority table (60-80%). tion or natural rock -80%) AND/OR tures contribute to hkfull and low flow II defined. Stream o bankfull benches, d floodplains along each. Transient	Erosion may be pr both banks. Vege 40-60% of banks. bevertical or unde 60% of strean sediment. Se temporary/tran instability. Depositi stability, may be	ower bank slopes. esent on 40-60% of tative protection on Streambanks may ercut. AND/OR 40-n is covered by diment may be issient, contribute on that contribute to forming/present.	are near vertical. E 60-80% of banl protection preser banks, and is insu erosion. AND/OF stream is covere Sediment is temp nature, and contrik AND/OR V-shape	cally/laterally unstable. Likely to n further. Majority of both banks near vertical. Erosion present on i0-80% of banks. Vegetative toection present on 20-40% of ks, and is insufficient to prevent psion. AND/OR 60-80% of the ream is covered by sediment. diment is temporary/transient in re, and contributing to instability. IOOR V-shaped channels have		stability. Severe tained within the ed below average tajority of banks ut. Vegetative on less than 20% of eventing erosion. bughing present. ks on 80-100%.	
	10% of l			s 10-40% of the bottom.	vegetative protecti banks and deposit	ed channels have ion on > 40% of the ional features which to stability.	vegetative protecti 40% of the bar sediment depos	iks and stable	than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.		CI
Score	3	3	2	.4		2	1.	6	,	2.0	
NOTES>>	N BUFFERS: A	Accase both bank	de 100 faat ringris			14-B-STR-	-	h may be accer	ntahla)		
. IIII AIIIAI	T DOI I LIKO. F	ASSESS DOUT DAIT		ditional Cate		ugii illeasuremen	ts of length & with	ir may be accep	NOTES>>		
	Opti	imal		ptimal		ginal	Po	or	Railroad and Chester		
Riparian Buffers		anopy cover and a derstory. Wetlands	containing both herbaceous and shrub layers or a non-maintained understory.	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with ~30% tree canopy cover.	lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non- maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.		ne banks.	
Condition		_	High	Low	High	Low	High	Low	-		
Delineate ripa escriptors. Determine so elow.	arian areas along on the state of the state	each stream ban each by measurin	g or estimating le	ngth and width. (	Calculators are pr	•	0.6  Ensure the of % R  Blocks en	iparian			
	% Riparian Area>	5%	10%	85%			DIOURS 80	100%			
Right Bank	Score >	0.6	0.85	0.5							
	% Riparian Area>	10%	90%					100%	CI= (Sum % RA * S Rt Bank CI >	cores*0.01)/2 0.54	CI
Left Bank	Score >	0.6	0.75						Lt Bank CI >	0.74	0.64
INSTREAM	M HABITAT: Va				ody and leafy deb	oris; stable substr	ate; low embeded	ness; shade;	NOTES>>		
	root mats: SAV: ri	ittle poole comple	exes, stable featu		I Category				1		
ndercut banks;	Toot mate, exty, ii	Conditional Category  Optimal Suboptimal Marginal Poor			I.						
				ptimal	Mar						
Instream Habitat/ Available	Opti	imal re typically present	Stable habitat eler present in 30-50%	ptimal ments are typically 6 of the reach and	Mar Stable habitat ele present in 10-30%	ments are typically % of the reach and	Habitat elements lacking or are ur	listed above are stable. Habitat			
Instream Habitat/	Opti	imal re typically present 0% of the reach.	Stable habitat eler present in 30-50% are adequate fo popul	ptimal ments are typically	Mar Stable habitat ele present in 10-30% are adequate fo popul	ments are typically	Habitat elements	listed above are estable. Habitat ally present in less the reach.			CI 0.50

0	ream Imp	act As	ssessm	ent For	m Page	e 2			
Project # Applicant		Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor	
N/A CSX		VA	R4SB	02080206	3/17/2016	06STR-S20			
. CHANNEL ALTERATION: Stream cros	sings, riprap, concrete,	gabions, or o	concrete blocks, s	traightening of ch	nannel, channeliz	ation,	NOTES>>		
mbankments, spoil piles, constrictions, livestock		onditiona			_				
Negligible Negligible	Minor		Mode 40 - 60% of reach	60 - 80% of reach	Sev	ere			
Channel Alteration Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized	the stream reach is disrupted by any of the channel alterations listed in the parameter stream the stream reach is disrupted by any disrupted in the stream reach is t	0-40% of the eam reach is upted by any of he channel rations listed in e parameter guidelines.		is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 8 disrupted by any alterations listed guidelines AND/C shored with gai cem	of the channel in the parameter PR 80% of banks bion, riprap, or			CI
SCORE 1.5	1.3	1.1	0.9	0.7	0.				0.50
	ONDITION INDE			IDITION UNI					
OTE: The CIs and RCI should be rounded to 2 decimal places.	The CR should be rounded to	o a whole numbe	r.				CONDITION INI I= (Sum of all C		
					(		ON REQUIREM		0
							I X LF X IF		
ESCRIBE PROPOSED IMPACT:									

**NC DWQ Stream Identification Form Version 4.11** 

06-STR-S-20

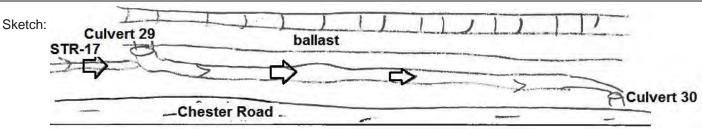
Date: 3/17/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.403738
Evaluator: J. Budnik, K. Astroth	County: Chesterfield	Longitude: -77.439941
<b>Total Points:</b> 19.25 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 5.5	Absent	Weak	Moderate	Strong
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0 Yes = 3			
a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 6				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	lo = 0	Yes	= 3
C. Biology (Subtotal = $\frac{7.75}{}$ )				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	)

\*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream originates from Cul 29. STR-17 flows into this stream. Stream is between Chester Rd and railroad.

Flows under Chester Rd via Culvert-30. Field Sheet: 17-B-STR-16.



# Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia

For use in ephemeral streams								
Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR#	Impact/SAR length	Impact Factor
N/A	DC2RVA - Area 06	VA	R6	02080206	3/16/2016			

Name(s) of Evaluator(s) Stream Name and Information

06-STR-S-21 J. Budnik & K. Astroth

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

		С	onditional Ca	tegory				NOTES>>	
	Optimal				Marginal				t: 17-B-
Riparian Buffers	Tree stratum (dbh > 3 inches) pres with > 60% tree canopy cover and non-maintained understoy. Wetla areas.	High Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, an with 30% to 60%	Low Suboptimal: Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree	High Marginal: Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh	Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with value (dbh >3 inches) present, with maintained understory.	High Poor: Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	Low Poor: Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	STR-17.	. 17-6-
		High	Low	High	Low	High	Low		
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5		
Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.  Ensure the sums									
2. Determine squ	uare footage for each by measu	ing or estimating leng	th and width. Cal	culators are provid	ded for you below.	of % F	Riparian		
B. Enter the % Riparian Area and Score for each riparian category in the blocks below.							equal 100		
Right Bank	% Riparian Area> 10%	90%					100%		
	Score > 0.6	0.5							
	1					ı		CI= (Sum % RA * S	cores*0.01)/2
Left Bank	% Riparian Area> 10%	30%					40%	Rt Bank CI >	0.51
Leit Dalik	Coore . O OF	0.5					1	LA Danie OL	0.04

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

THE REACH CONDITION INDEX (RCI) >> 0.19 RCI= (Riparian CI)/2 COMPENSATION REQUIREMENT (CR) >> CR = RCI X LF X IF

### INSERT PHOTOS:



Top Left: View upstream from CUL-32 Bottom Left: Deeeply incised portion of stream Top Right: View downstream from CUL-32 Bottom Right: CUL-33

NC DWQ Stream Identification Form Version 4.11

06-STR-S-21

Date: 3/17/2016	Project/Site: DC2RVA - Area 06	Latitude: 37.403119
Evaluator: J. Budnik, K. Astroth	County: Chesterfield	Longitude: -77.440435
<b>Total Points:</b> 18.5 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = <u>7.5</u> )	Absent	Weak	Moderate	Strong	
1 <sup>a.</sup> Continuity of channel bed and bank	0	1	(2)	3	
2. Sinuosity of channel along thalweg	0	(1)	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	(1)	2	3	
7. Recent alluvial deposits	0	(T)	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley		0.5	1	1.5	
11. Second or greater order channel	No	0 = 0	Yes = 3		
artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal = 4.5					
12. Presence of Baseflow	0	(1)	2	3	
13. Iron oxidizing bacteria	0	1	(2)	3	
14. Leaf litter	1.5	1	0.5	0	
15. Sediment on plants or debris	0	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	(No	0 = 0	Yes:	= 3	
C. Biology (Subtotal = 6.5					
18. Fibrous roots in streambed	3	2	(1)	0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3	
21. Aquatic Mollusks	(0)	1	2	3	
22. Fish	0	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.5	1	1.5	
25. Algae	0	0.5		1.5	
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0		
*perennial streams may also be identified using other method:					
Notes: Ditch along Chester Rd. Flows into STR-16	6. Likely has a gro	undwater conne	ction. Field Sheet:	17-B-STR-1	

Sketch:

ballast

Chester Road